#1 Atari Computer Magazine

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Antic®

The ATARI® Resource

DECEMBER 1984 VOLUME 3, NUMBER 8

Buyer's Guide

125 Best Products To Turn On Your Atari

Biffdrop Returns
Our most popular game has a sequel

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Reviews! • Everything You Need To Know About I/O
• Push Text Into Less Memory

Free Inside: 6 Type-In Programs

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THE MMG BASIC COMPILER

ATARI OWNERS FINALLY!!

The BASIC Compiler for Every Need and Every Program!

Tired of using those other BASIC compilers that don't do the job for you? Is there a long list of valid BASIC commands that they don't support? Or don't they compile to true 6502 machine language for maximum speed? Or do you have to rewrite your whole BASIC program just to find out that it won't run when compiled?

Announcing THE MMG BASIC COMPILER

THE FIRST COMPLETE BASIC COMPILER FOR THE ATARI COMPUTERS THAT PRODUCES NATIVE 6502 CODE

What is a BASIC compiler?

BASIC, as we all know, is an easy-to-use language for ATARI computers. It's only disadvantage is that it's SLOW. For some types of functions, it seems to take BASIC programs forever to execute. We all know that the fastest language available is machine language, the language of ones and zeros. But don't worry! Now you don't have to learn a whole new language just to have programs execute with machine language speed.

The MMG BASIC COMPILER takes your BASIC program and converts it to machine language for you. Furthermore, this machine language program will autorun, simply by naming it AUTORUN.SYS, putting it on a disk with the DOS 2.0S files on it, and turning on your computer with that disk in your drive.

What will a compiler do for me?

Using the MMG BASIC COMPILER, you can program in BASIC, the same BASIC you already know, and get your program up and running. Then the MMG BASIC COMPILER will convert your BASIC program for you, producing lightning-fast programs to rival those of the professionals. Imagine moving a player from the top of the screen to the bottom in less than a second! Try that using other compilers! Imagine what your programs will be like when they're compiled to true 6502 machine language. The MMG BASIC COMPILER has been used to produce commercially available arcade-type games from BASIC source code, and can do the same for you!

MMG would even be interested in marketing your results! If you produce what you believe to be a marketable program, call us for details!

Can your compiler:

- compile to fast 6502 machine language, not slow pseudocode (P-code)?
- support trigonometric functions like ATN, COS, SIN?
- support mathematical functions like CLOG, EXP, LOG, RND, SQR?
- support RUN "D:PROGRAM"?
- support ATARI string handling like A$(2,4)="BOD"?
- support COMmon variables?
- support the POP command?
- support the LPRINT command?
- support either RAD or DEG calculations?
- support both integer and floating point arithmetic?
- operate in either single or true double density?
- allow DATA statements anywhere in your program?
- produce assembly language source code of your program for your own use?

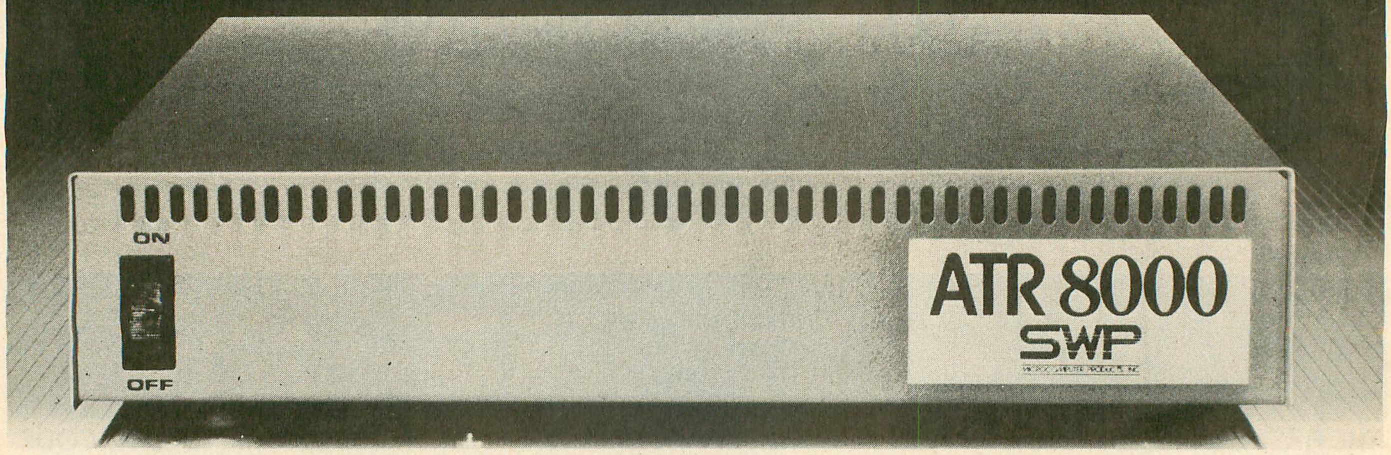
The MMG BASIC COMPILER does!

The MMG BASIC COMPILER comes with both single and double density versions on the same disk, and is available from your local computer store, or send $99.95 plus $3.00 for shipping and handling to:

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Visa, MasterCard, or COD orders accepted. New Jersey residents please add 6% sales tax.

CP/M and MS-DOS Compatibility For All Atari Computers



"A fine CP/M machine . . . the ATR8000 closes the gap that has separated Atari owners from the rest of the software market."

—Byte Magazine

CP/M compatability for your Atari — only from SWP.

Now you can run CP/M programs on your Atari 400, 800, 1200 and XL series computers.

The ATR8000 from SWP Microcomputer Products is a 4MHz, 16k RAM complete Atari interface. When you add the optional 64k RAM, the ATR8000 will run CP/M!

The ATR8000 features:

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- The ability to run up to four 5 1/4" or 8 " drives of any mixture, type and density (MY-DOS is optional and is used for double density Atari operations).
- Double density CP/M 2.2.
- 80 column wide display with 40 column moveable window. Or an optional 80 column software (AUTOTERM-80) program that can be used with a black & white TV or monitor.

When you order your ATR8000, you'll not only receive the hardware and software you need, but also an easy to read owner's manual and CP/M supplement that will take you into the exciting world of CP/M.

SWP
MICROCOMPUTER PRODUCTS, INC.

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☐ AUTOTERM-80 (80 column display for CP/M or MS-DOS)@$29.95 + $2.00 shipping.
* Must be used with 64k ATR8000.

Specify Atari model computer you own: ________________
Configurations: (check one) 5 1/4" drive ____ or 8" drive ____

☐ I want to learn more about the ATR8000 and CO-POWER-88. Enclosed is $1.00 (cash only) for more literature, including a comprehensive listing of MS-DOS and CP/M-86 software that runs on the CO-POWER-88.

Method of payment:
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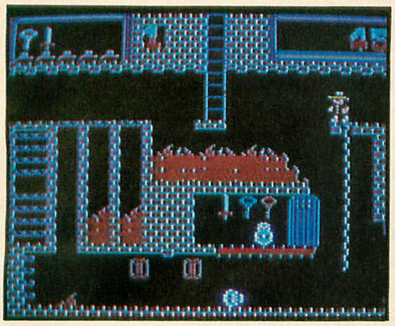
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BEST NEW PRODUCTS FOR YOUR ATARI INSIDE

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DECEMBER 1984, VOLUME 3, NUMBER 8

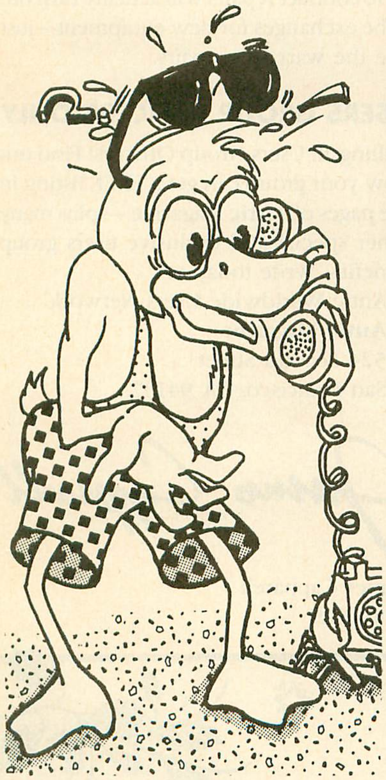


Our Buyer's Guide features games, utilities, hardware and more . . . . . page 37

SPECIAL SECTION

FEATURES

DEPARTMENTS



Slyvester Biffdrop is back, and he's in trouble . . . . page 26

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December 1984
Volume 3, Number 8
ANTIC—The ATARI Resource is published twelve times per year by Antic Publishing. Editorial offices are located at 524 Second Street, San Francisco, CA 94107. ISSN 0745-2527. Second Class Postage paid at San Francisco, California and additional mailing offices. POSTMASTER: Send address change to **Antic**, 524 Second Street, San Francisco, CA 94107.

Editorial submissions should include program listing on disk or cassette, and text file on media and paper if text was prepared with a word processor. Media will be returned if self-addressed stamped mailer is supplied. **Antic** assumes no responsibility for unsolicited editorial material.

editorial

TYPO II. . .STARTING NEXT ISSUE

TYPO II is ready — **Antic's** all-new, much easier proofreading program! This short BASIC program immediately shows the exact line where you made a mistake while typing in listings from the magazine.

TYPO II automatically checks your typing line-by-line. You'll know if you mistyped something on any line of the listing. . .as soon as you type it!

ATARI SERVICE NEWS!

One of the questions **Antic** has been asked most often since the Jack Tramiel takeover of Atari is: "What's happening to repair service?

Antic can now give you the answer. . .

At press time, Atari Corp. had just sent a letter to all the approximately 1,700 Factory Authorized Independent Service Centers in the U.S. The letter said that the centers had 30 days to either convert to a new status of "Non-Warranty Referral Network". . .or remove all their Atari signs and send back all Atari technical documentation.

Under the new policy, 90-day warranty coverage must now be obtained by exchanging a defective item at the store where you bought it. This is exactly the same system that Tramiel found to be cost-effective at Commodore.

But non-warranty repairs are obviously of greater concern to most **Antic** readers. These repairs will be available from the service centers that choose to become "Non-Warranty Referral Agents." Next month's **Antic** will have a directory of currently active Atari service facilities. (Repair contractors who wish to appear in the directory should write to Steve Randall at **Antic**, or phone 415-661-3400.)

What about parts? The policy now is that Atari won't sell "accessories and components" direct to the public. You can only get Atari-made "controllers, TV switch boxes, power adaptors, etc." from the Referral Agents— which is another reason you'll want to see the directory of agencies in **Antic** next month.

As for Atari Service Contract. . . the corporation won't let any new ones be sold. But they'll honor the contracts currently in effect, according to the statement by Jere Bernardoni, U.S. Consumer Product Service Manager. However, for a Service Contract repair you must mail the defective item to:

Atari Corp.
Consumer Product Service
P.O. Box 61657
Sunnyvale, CA 94088

Our guess is that most of these Tramiel-style contract repairs will actually turn out to be exchanges for new equipment—just like the warranty repairs.

USERS GROUP OFFICERS ONLY

Calling all Users Group Officers! Find out how your group can get a FREE listing in the pages of **Antic** Magazine — plus many other special and exclusive users group benefits. Write today to:

Antic Worldwide Users Network
Antic Magazine
524 Second Street
San Francisco, CA 94107

James Capparell

James Capparell
Publisher

A VIDEO CHRISTMAS CARD

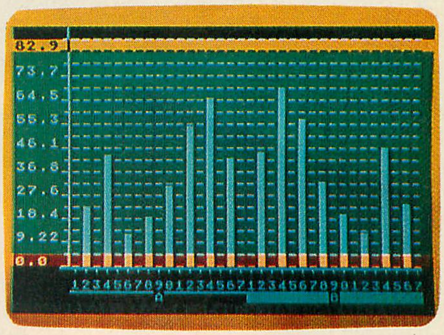
As a special holiday bonus from **Antic** Magazine + Disk, we present Ed Brown's Christmas card. It will play a soundtrack of "Ave Maria" while it displays an elegant drawing. (The listing was too long to print for typing.) Disk subscribers, RUN "D:AVEMARIA.BAS".

Introducing
The first programmable spreadsheet Now with integrated graphics.

ATARI®



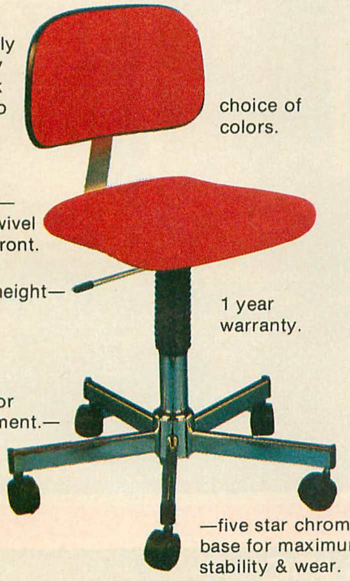




Create worksheets easily.
No matter what kind of data you're interested in—whether for personal or business matters—calculation is easy with CPA. Set up business spreadsheets like break-even point and depreciation. Or figure personal finances such as loan amortization, commissions and IRA projections. Use any of three different numerical formats: dollars & cents, integer, or floating point.

Even the kids could use it for their school work. Without a lot of hassle, CPA was designed to be easy to use. Just press one key to activate any of the main menu selections. And informative prompts and help messages guide you step-by-step.

Chart the results.
Make more sense of your figures with CPA's built-in graphing. View your data in bar chart form for any three sets of data. Or use a special graphics feature that allows you to interface with B/GRAPH, the professional graphics-charting and statistical analysis program from Inhome Software. With CPA data and B/GRAPH you can create 3-D bar charts, pie charts, line graphs and much more.



Powerful!
Despite the one-key menu selection and ease of use, CPA is a powerful program that will grow with you. In fact, CPA may be more powerful than any other spreadsheet for Atari computers because it allows use of all commands native to BASIC. (Technically this means full use of If/Then logic, Relational or Boolean operations, all algebraic and trigonometric functions, and even REMarks, etc.). Because you don't have to rely on built-in functions, you can program CPA for practically any application. And CPA comes with comprehensive professionally written documentation. All in a convenient size, lay-flat binder, for only $99.95. Similar programs offering this much power would normally cost hundreds of dollars more.

There's more.
Included are over a dozen pre-programmed modules of useful applications in finance, business and real estate. Ready to load programs that are fully explained. Start using your CPA program from the very first day!

There's even more.
As part of this special introduction, you will receive a handsome and sturdy operator's chair that soon will become the best seat in the house. Since it can slide under any desk or table, it takes up virtually no floor space. And it can be used for the kitchen/utility room, the kid's room and many other locations. Or as a fine gift. Check the illustration to see its many outstanding features.

This introductory package represents a tremendous value. Take advantage of it. Hurry though. This offer is limited. Fill out and send in the coupon today.

CPA requires 48K, disk drive, BASIC, printer optional.

Name ______________________ A1D84
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City ____________ State ________ Zip ________
Select color: □ Red (shown) □ Grey □ Brown
Please remit $99.95 plus $9.00 shipping & insurance.
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i/o board

GRAPHICS HARDWARE QUESTIONS

I found your magazine invaluable while I was learning BASIC, and I now find your utilities excellent and easy to use. I have some questions I hope you can answer. Are there digitizing cameras available for the Atari? Does the Atari light pen software work with other brand light pens?

Steve Miller
Cincusareur, NY

We know of no digitizing cameras for the Atari. Atari's light pen software does work with other pens. If the light pen does not have a button, use the [OPTION] key.
—ANTIC ED

BUYING SOFTWARE ABROAD

I am an Atari owner living in Hamburg, West Germany. I wondered what I must do to buy any software from the United States via air mail? What method of payment is preferred? Also, are there software compatibility problems with the different hardware standards (particularly with TVs)?

Thomas Irle
Hamburg,
Fed. Rep. of Germany

There is no set answer, as different companies have different policies. It's best to contact individual companies.
—ANTIC ED

UNDERLINING WITH ATARI

I'm using my Atari 800XL, 1027 printer and AtariWriter to write my microbiology thesis, but I can't get the printer and computer to underline.

Martha Poore
Lexington, KY

To underline with the equipment you have, try holding the [CONTROL] key while pressing the [O] to start underlining. Then type 15, then the words you want underlined. To stop underlining, type the [CONTROL][O] combination again, then 14. —ANTIC ED

SCREEN DUMPS

Is there a way to load, save and dump pictures made with Koala Pad or MicroPainter? I am trying to dump pictures to an Epson MX-80 printer.

Oren Selah
North Hollywood, CA

In January 1984, we published a program called "Screen Dump" which was designed for the Epson FX-80, but could be adapted for a Gemini 10-X by changing the value of CHR$(24) in line 120 to CHR$(16). "Screen Dump" was written to dump MicroPainter pictures to the printer, but also accepts uncompacted Micro Illustrator files. These are obtained by pressing the [INSERT] key, which will save your screen picture to disk under the filename PICTURE. (Press [CLEAR] to load any file called PICTURE.) Since Micro Illustrator is the software used by Koala Pad, Atari Touch Tablet and Tech Sketch Light Pen, you can use "Screen Dump" for any of these programs. We don't have the time or the equipment to customize screen dump programs for every printer on the market. If you have customized the "Screen Dump" program for some other printer, send us the changes and, if they're short enough for I/O BOARD, We'll publish them.
—ANTIC ED

SERVICE, PLEASE

I have an Atari 410 Cassette recorder with problems and am in need of a schematic. Could you please direct me to a source for service or information.

Gerald Brandt
Harlingen, TX

Look for a list of Atari service centers across the country in our January, 1985 issue, on sale December 1. —ANTIC ED

AN IMPORTANT REMINDER

I'm MAD!!! I just lost 60 valuable subroutines to an inferior quality disk. That's not all. I don't have a back-up disk. I should have made one.

Please take my advice—invest in quality disks, always purchase from authorized dealers, and read the warranty. And most importantly, ALWAYS make a back-up disk.

Alan Porter
Auburn, PA

PILOT PLOTS DOTS

I have added four lines of code to "Telling Time in Pilot" in **Antic** (Sept., 1984). This makes it easier for beginners by adding dots around the clock face at the five minute intervals.

```
71  *DIGITS
72  GR:PEN YELLOW; GOTO 0,0;
     TURNTO #Y;GO 23
73  C:#Y=#Y+30
74  J(#Y<>360):*DIGITS
```

Steven Hill
Sparks, NV

APING YOUR GRAPHICS DUMPS

I have an Atari 800, an Atari 1020 plotter and a BMC dot matrix printer. Is there any way for me to dump my Atari Touch Tablet screens to my printer or plotter? I'm using the Ape-Face Interface and I've been told this could make a difference.

Roger Malinowski
Reading, PA

After trying a few graphics programs on our in-house Ape-Face, we found it would not allow graphics dumps. We contacted Digital Devices, the manufacturer, and were told that their earlier releases had problems with graphics dumps, but that the newer ones should work on most software. You can tell which version you have by unfastening the four screws which hold the box together and looking at the chips. If you find three chips and one of them has NEC printed on it, you have the early model and should contact Digital Devices for an exchange. If your Ape-Face is still within its one year warranty, you can exchange it for a new one with no charge. If you're outside the warranty period, contact Digital Devices anyway and see what they say. You can reach them at (800) 554-4898. —ANTIC ED

CALLING PLATO

*Yes, the new Atari is supporting the **Learning Phone** cartridge, used to hook up to Control Data's Plato System. Look for the cartridge at your favorite retailer's by the end of January. Overseas manufacturing won't have it back in time for Christmas, we hear.* —ANTIC ED

continued on next page

i/o board

ASTRA NEWS

We at ASTRA Systems appreciate your recent review (August, 1984) of our 1620 drive. Since then, the 1620 has been equipped with rotary-latch doors which are easier to use and easier on disks. Additionally, the DOS we now supply is SMARTDOS.

Drew Featherston
Plant Manager, ASTRA
Santa Ana, CA

BUGS IN THE ASSEMBLER

A curious bug in Atari's Macro Assembler/Editor (AMAC) lets you make a copy of the disk itself or of individual files via DOS, but fails to boot on the backup disk. This means you can't make a backup copy. Also, the assembler can't reside on the same disk as files to be assembled, since the original is write-protected. As a result, you have to re-insert the master disk every time you do an assembly.

Solution: use DOS to copy the file AMAC to a backup disk. Then run the following program (you can execute it directly, by typing it in without a line number).

```
10 OPEN #1,12,0,"D:AMAC":
FOR I=1 TO 8:GET #1,A:NEXT I:
PUT #1,208:PUT #1,34:CLOSE #1
```

This changes two bytes in the duplicate program, allowing it to run normally

James Tunnicliffe
Anaheim, CA

STARTING A BBS

I want a hands-free bulletin board system that can be up for 24-hours a day. I am planning to buy a modem and 850 interface, and need to know what else I must have to start a BBS.

Del Rice
West Pittsburg, PA

Starting a BBS is not difficult. Maintaining a BBS takes time, dedication and money, but it is very rewarding. Please see the Communication department in this and upcoming issues, where we will be discussing the running of bulletin boards. —ANTIC ED

OF APPLES AND ATARIS

Your "Electronic Notebook" (July 1984) was written before the release of the Apple IIc. It's easy to get the Apple and Atari 850 interface to talk to each other. Here's the wiring diagram for connecting the serial port on the Apple IIc (port 2) to port 1 on the Atari 850 interface.

	Apple IIc	Atari 850
PIN	1	6
PIN	2	4
PIN	3	5
PIN	4	3
PIN	5	8

Pin 5 to 8 doesn't matter for the computer hook-up but is used with a modem. For software, I used a modified version of AMODEM on the Atari and ASCII EXPRESS on my Apple. Standard AMODEM will work fine.

Vern Mastel
Mandan, MD

DINOSAUR OR MICROCHIP GEM?

Do I have a dinosaur in my home? I recently purchased an Atari 1200XL at a clearance sale. Since then, I've had trouble getting information about the Atari. I have high hopes for this plastic and microchip gem, but I am afraid you're my last resource for information. The toll-free number you used to publish is disconnected. Salesmen try selling me a Commodore or Apple, telling me the Atari is extinct.

In light of my predicament, I appeal to you for aid and comfort. Tell me what I have here, and where to get books, cartridges and information on the 1200XL.

Mark Pitts
Ft. Benning, GA

*Fortunately, you won't need a paleontology background to use your Atari—it's still alive and evolving!!! You can get the Atari BASIC cartridge and most anything else you'll need for your 1200XL from dealers listed and advertising in this issue of **Antic**. For specific books and resources, please see the Buyers' Guide, also in this issue. It contains the best products (all available) picked by our staff, along with manufacturers' address and phone numbers.* —ANTIC ED

ACTION! ANYONE?

I've been programming with the new Action! language and loving every minute of it. It's fast and fairly easy to learn, but I wish I could have more program examples to learn from. Are you planning to carry more Action! listings? How about something on disk?

Steve Turner
Grand Rapids, MI

Well, folks, what do you think? We'd really like to find out how much interest exists for Action! Drop us a line, and let everybody know. —ANTIC ED

THE BUSINESS

I would like to inform fellow **Antic** readers of a company that advertised in your magazine but never shipped a product. Novin never sent me the ANTICA-4 I ordered and paid for, and never responded to any of my subsequent letters. What happened?

Gregg Ramsey
Sydney, Australia

Unfortunately, Novin went out of business with a number of unfilled orders from our subscribers. If it makes you feel any better, they owe us money too.

—ANTIC ED

help!

ADVENT X-5

The following line was inadvertently omitted from J.D. Casten's "Advent X-5" (**Antic**, November 1984). The game will run properly if you add:

```
8020 RUN
```

SO YOU WANT TO START A BULLETIN BOARD?

by SUZI SUBECK

More people than ever want to turn their Atari into a bulletin board system (BBS). It's not that hard to be a system operator (sysop), and it's a very rewarding way to use your computer. But there are a few things you should think about before rushing out and buying bulletin board software.

Any BBS system includes hardware and software. Operating a BBS 24 hours a day means your computer is not free for games or other programming. Your system will require at least: one computer, a disk drive, a monitor and a modem. An interface makes life easier, and additional drives give you more room for uploads and downloads. Once installed, your system will be getting an extraordinary workout. The modem is constantly turned on and off, and the drives are being accessed continually.

The second basic cost of a bulletin board is the software. Public domain software is available, and commercial programs cost between $40 and $80. **Antic** will examine the best software and hardware for starting a BBS next month.

Running a BBS requires a phone line for your computer, which means you will need a second line to handle all the rest of your everyday phone calls. Don't expect to be receiving or making voice calls on your BBS line. Also, if your board line includes call waiting, BBS callers will be bumped off every time a second call comes in.

A second phone line means a second phone bill. But if you were previously addicted to microcomputer telecommunications and ran up big long distance phone bills, starting a BBS will cut down on those bills. Other addicts will be calling you!

Expect to invest considerable amounts of time with a BBS. If the board uses passwords, you will constantly be updating your password log. You will also be responsible for rotating the downloads, testing the uploads, cleaning up and updating the message bases, as well as chatting with callers. You will have to create welcome messages, bulletins, and any other file you want to make available. Regular maintenance of your BBS will take at least an hour a day.

Because part of the time you invest in your BBS will be spent customizing features, or solving software and modem interface problems, a knowledge of BASIC is extremely helpful. The ability to program in Atari BASIC will allow you to tailor your system to your wishes. It is also a good idea to keep a printout of your BBS program handy, with function divisions clearly marked, so that if a problem arises, you can quickly identify where it occurred and solve it.

In addition to anticipating the time and money it takes to run a BBS, you must consider a few of the potential problems with boards, including abusive callers. These sickos are rare, but can cause major problems. Some abusive callers harass the system operator about the alleged shortcomings of the BBS, while others try to crash the system by uploading programs that have buried commands to format the system's disks.

It's not hard to protect yourself from abusive callers. Have your board's software backed up. Test all upload files before allowing others to access them. Write protect any disk before running newly uploaded files.

An additional hazard exists with callers who leave messages with illicit Sprint or MCI access numbers. Phone companies warn that using or providing access numbers is illegal. If you run a board which lists such numbers, you could have your equipment confiscated and be subject to criminal charges. The best way around this is never to list access numbers on your board. If a caller leaves numbers, you should erase them immediately.

A final caution—running a bulletin board is addicting.

Suzi Subeck contracted the Atari bug from her husband and two children. She now edits the Computer Squad users' group newsletter, operates a BBS, and writes articles on telecommunications for ***Antic****. The Subeck family is a familiar sight at Atari events within range of their Chicago suburban home.*

TIPS ON BUYING EDUCATIONAL SOFTWARE FOR YOUR CHILDREN

How have you been deciding what educational software to buy for your children? Word of mouth? What the package says? Reviews?

Antic has looked at over 100 pieces of software and consulted with educators in the field to compile software-choosing guidelines for YOU, the parent.

- Ask (insist if necessary) to see the software demonstrated at the store. This may be easier than you think. I've been experimenting at several local software retailers and they'll usually let you see a demonstration.
- Choose software that you can feel involved with as a parent.
- Look for open-end programs. That is, see that the exact same thing does not happen each time you use it.
- Is the program expandable? Does it have an editor which will let you change it? For instance, what do you do with a spelling program when your child has mastered all the words? It would be nice to add new ones.
- Are instructions easy to follow?
- Are any pre-required skills stated?
- Is the documentation clear? Does it include some follow-up activities related to the skills in the program?
- Does the program let children teach themselves?
- Is the program tolerant of mistakes? Does it handle saying "no" or "wrong" supportively?
- Does the program give honest positive reinforcement for correct answers?
- Is there good interaction with the computer? Will the child be able to do more than just press the return key and watch the computer have all the fun?
- Is the educational goal of the software clear and is the content accurate?
- Is the program fun? Drills and quizzes may work fine in school in the context of a lesson. Home education needs to be more inviting.
- Watch for good visual quality screen appearance: Make sure words are legible and not cut off by the edges of the screen. Pay particular attention to the look of the words if you're using a TV for a monitor because text is generally not as clear. Text adventure games may get hard to read after a while on a TV set. Watch for the speed with which the words and pictures appear. Not too fast for the younger ones.
- Programs categorized as "games" may be educationally worthwhile if they involve some logical thinking.

—A.M.

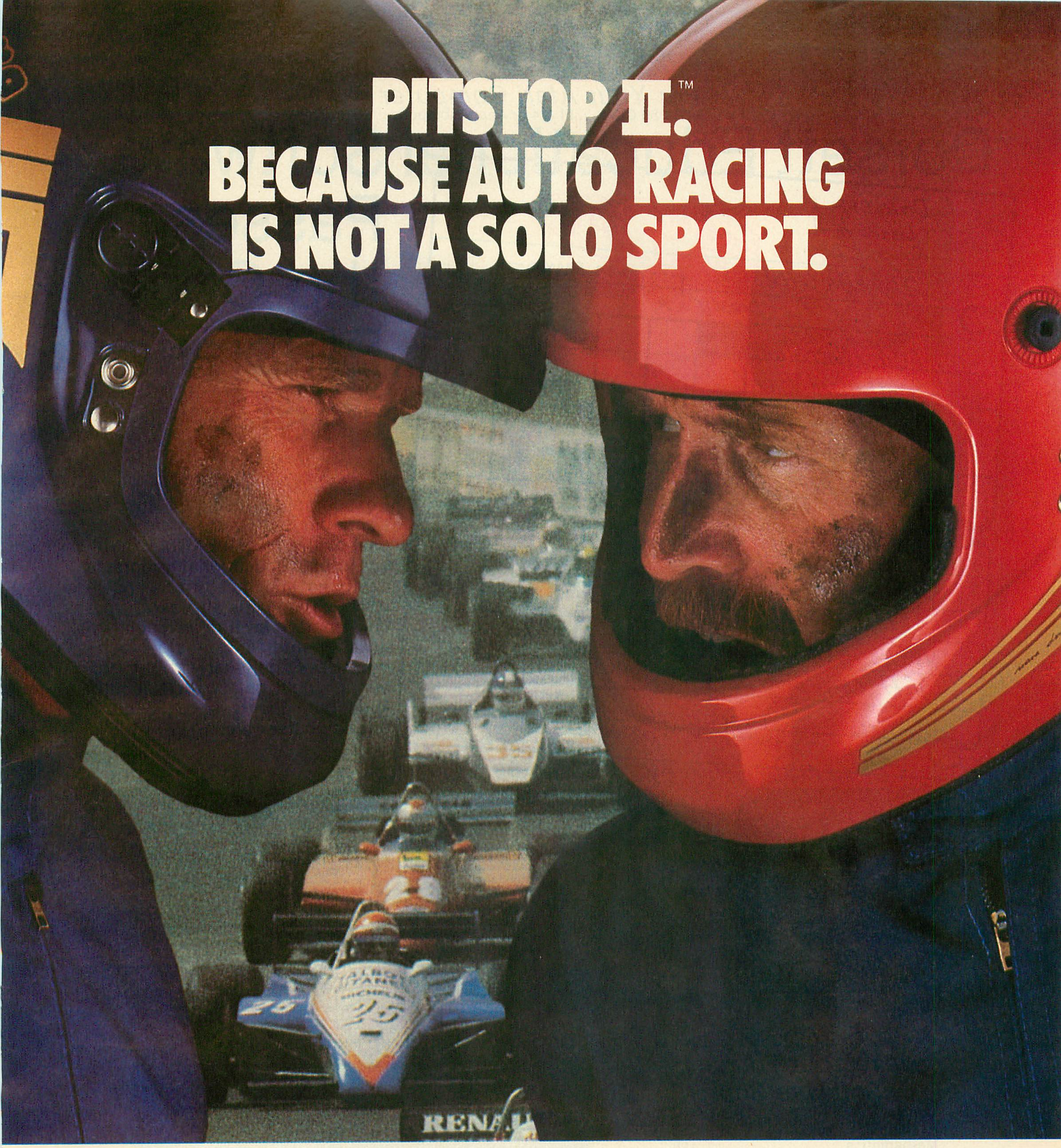
Educators Speak About Software

Ellen Bialo, from EPIE, Educational Product Information Exchange, stresses that for pre-reading children the parents must be involved. Also, she mentioned that sometimes very young children don't understand that what they do on the keyboard affects what happens on the screen. If this happens, you should explain the connection to the child.

Cindy Char, research psychologist at the Bank Street College of Education suggested to **Antic**: Try letting your children use your software tools. For example, by introducing them to the word processor you use they can start to see what jobs computers are good for. Practicing spelling words might make more sense when done with a spelling checker to correct a story your child has written.

Bobbie Goodson, computer resource teacher for the Cupertino, California School District says, "Text adventures are great for older children. They bring imagination into play and I can't think of anything better."

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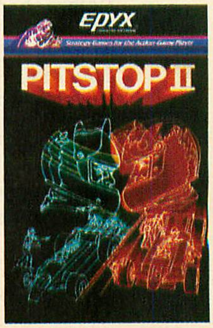




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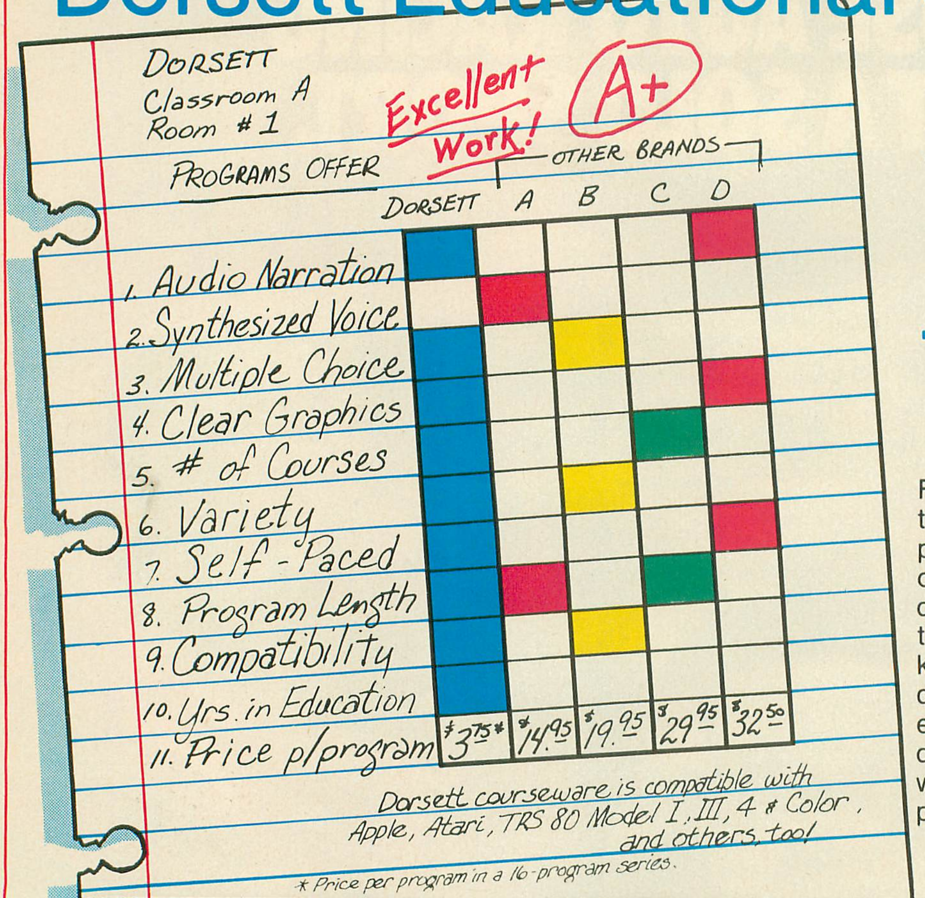


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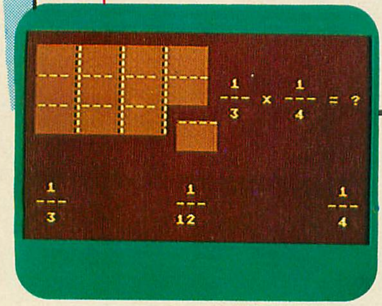
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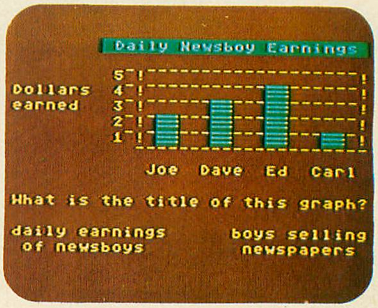


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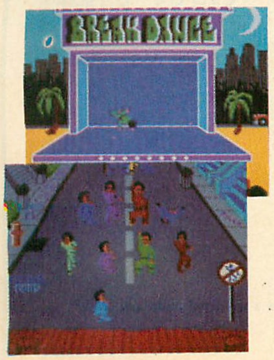
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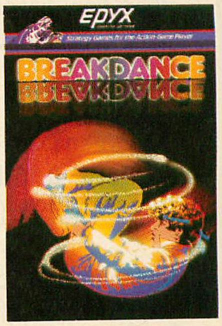
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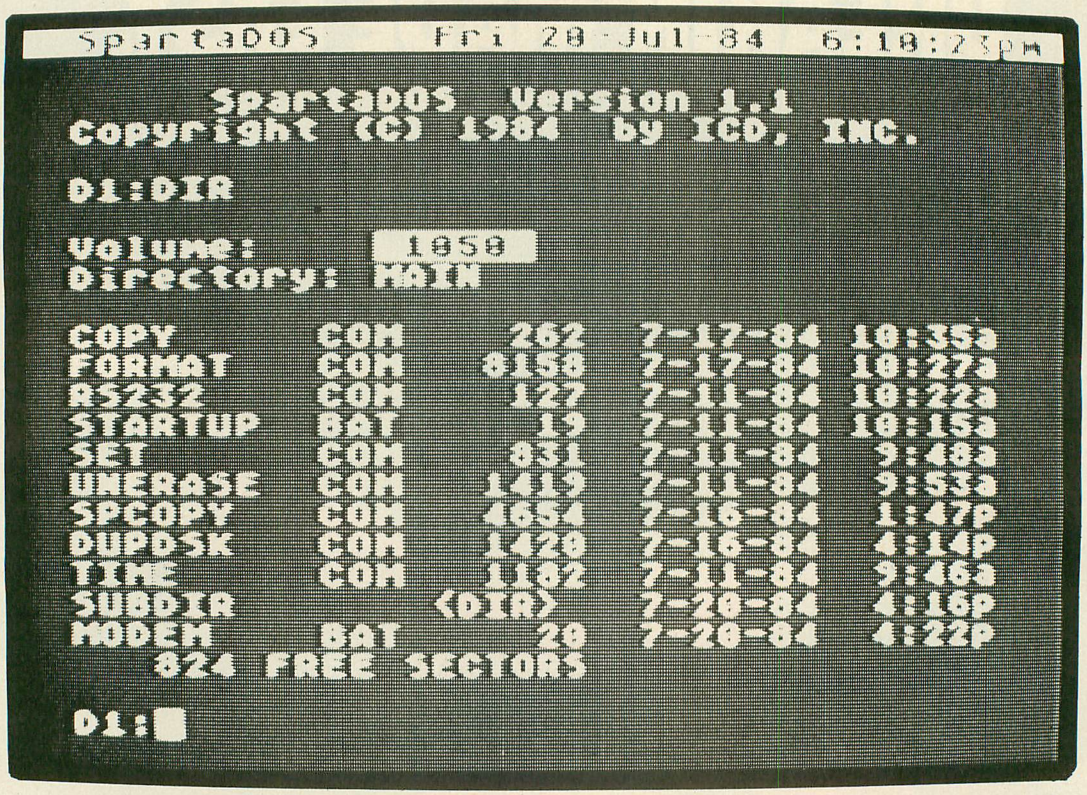
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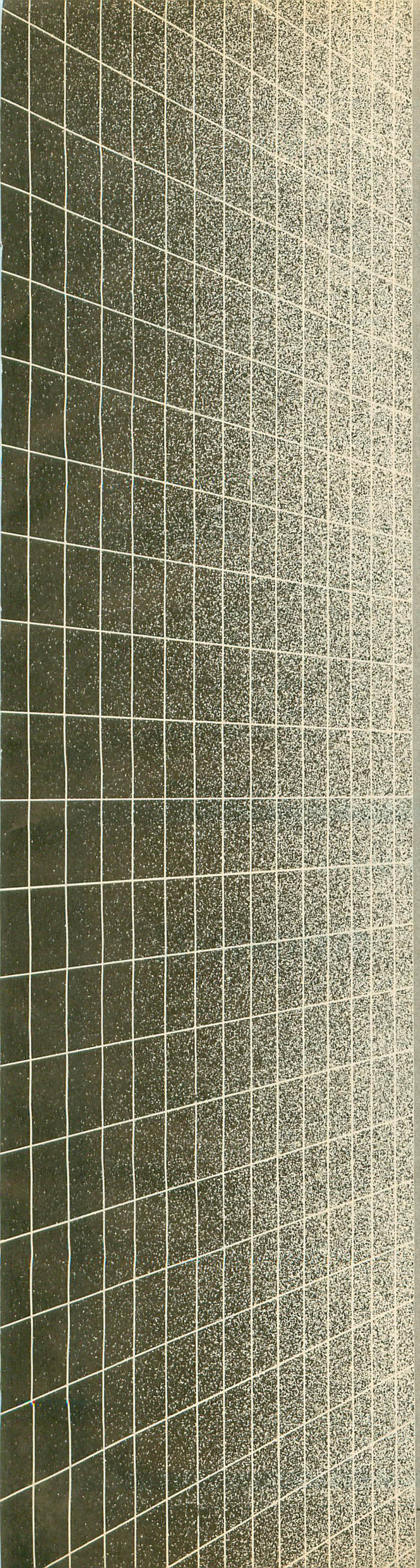
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INFO BITS

Simplest database program ever!

by ANDY BARTON

Have you ever flipped fruitlessly through stacks of magazines or books looking for a piece of information that you saw two months ago but need today? Perhaps you jotted down a note or clipped the item. But by now the item has disappeared forever, the way most valuable scraps of paper do. Such disorganization resulted in the creation of Info Bits.

Once you've typed your notes and references into Info Bits you can retrieve them by searching for a key word or phrase found anywhere in your entries. Unlike other file management systems, there are no records, fields, or files to dimension, no search schemes to creat, no heavy manuals to ponder, etc.

USING THE PROGRAM

Type in Listing 1, check it with TYPO, and SAVE a copy of the corrected version. You needn't type in Listing 2 to use Info Bits. Before you RUN the program, you must have a disk with the

continued on next page

A superbly simple file program. It provides an easy way to save and retrieve notes and references to short items that catch your interest—perhaps while perusing Antic and other favorite magazines. The BASIC program runs on all Atari computers of any memory configuration and requires a disk drive. Antic Disk subscribers RUN "D:INFOBITS.BAS".

data file INFOBITS.FIL on it in drive one. To create the file, execute the following:

OPEN #1,8,0,"D:INFOBITS.FIL":
CLOSE #1 [RETURN].

Once you've done this, RUN the program. You'll see a menu with two choices—Add to File and Search for Entry. The first time, press [1][RETURN]. Now type in an entry or two, pressing [RETURN] to mark the end of each entry. You don't need punctuation to mark off fields for separate items within an entry—just type a space or two. An entry can be as long as 119 characters, about three screen lines. If you were cataloging articles from **Antic**, you might first enter the type of article or program, then the title, a brief description, the date of the magazine, and the page number of the article. Here's a sample entry cataloging Info Bits:

FILE PROGRAM INFO BITS FAST, EASY STORAGE AND RETRIEVAL OF SHORT NOTES DECEMBER 1984 PAGE 17 [RETURN]

You needn't type entries entirely in upper case, but it makes things easier during the search if you don't have to remember whether you typed an entry in upper or lower case. When you're finished entering, press [RETURN] at the prompt to close the file and return to the menu.

To search for a date, choose menu selection 2. You can search for one or two characters, a word or phrase, or the entire entry, up to 119 characters. The program displays on screen each entry in the file that contains the key. If there is more than one screen full of information, the program pauses after each screen and prompts you to press any key for the next. If you enter 'ALL' as a keyword, the program displays the entire file.

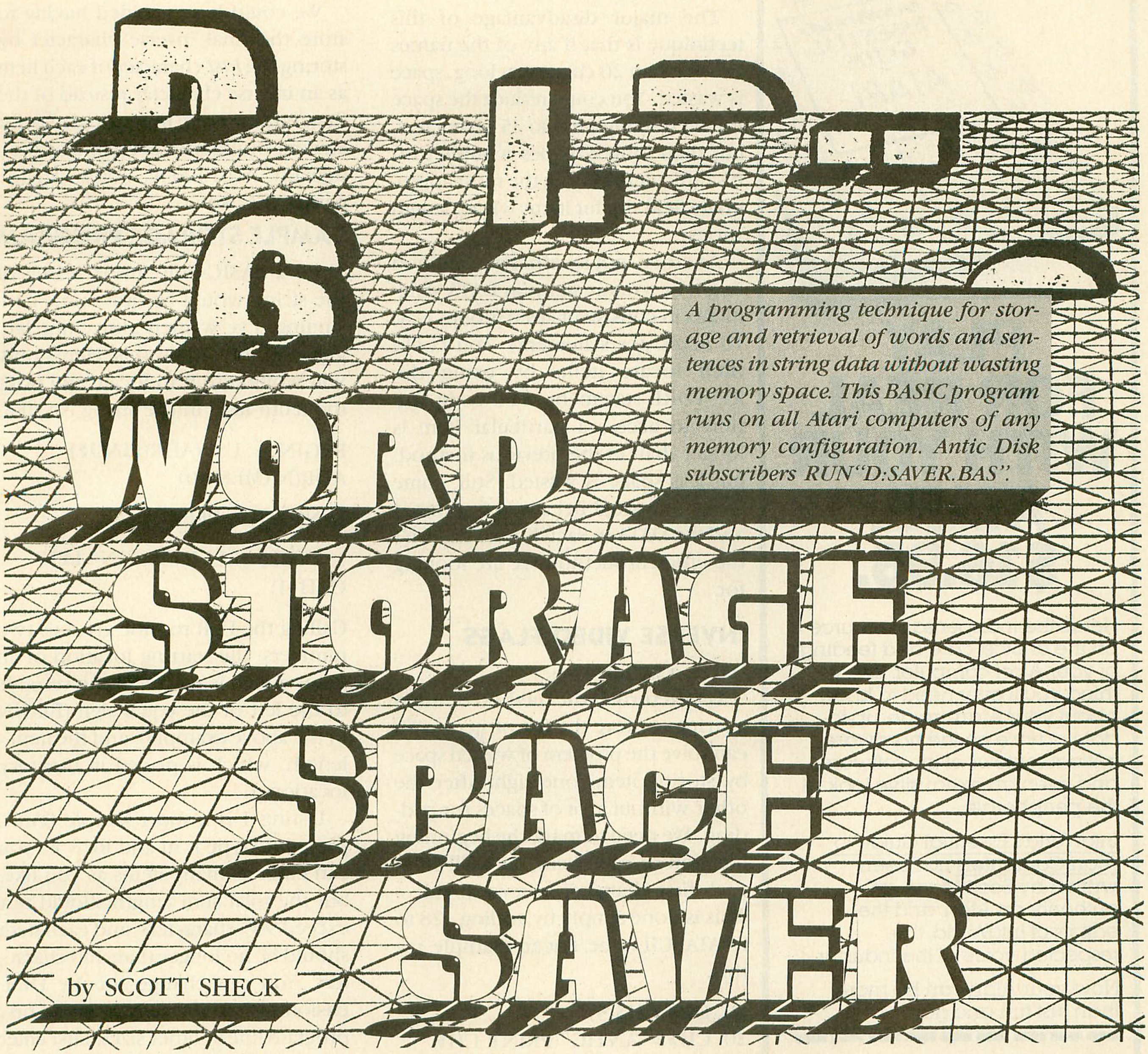
Listing 2 (INFOBITS.ASM on the **Antic** disk) contains the assembler source code for the machine language used in Info Bits.

If you want to send the program output to a printer, change the S in line 30 to a P, and change the ? in line 1040 to LPRINT.

And don't forget to write **Antic** if you create any interesting changes in this program.

*Andy Barton is a Registered Nurse in San Carlos, California. He's also an extremely creative and tenacious programmer in both BASIC and machine language. You'll be seeing his name here a lot—particularly because he just completed **Antic's** new, improved line-by-line TYPO II program which starts appearing in the magazine next month.*

listing continued on page 53



WORD STORAGE SPACE SAVER

A programming technique for storage and retrieval of words and sentences in string data without wasting memory space. This BASIC program runs on all Atari computers of any memory configuration. Antic Disk subscribers RUN"D:SAVER.BAS".

by SCOTT SHECK

If you're writing an adventure game or any program that deals mainly with words, phrases, and sentences—you need a memory-efficient way to easily store and retrieve your text data. Many versions of BASIC have string arrays that allow you to store a group of text items under one variable name and call up any item by an index number. For instance, in a text adventure, you might wish to use a list of weapons, including knife, gun, mace, short sword, and magic sword. You could create string array WEAPON$, and store each weapon name with a different subscript (e.g. WEAPON$(3) = "MACE").

Unfortunately, Atari BASIC does *not* have string arrays. With Atari BASIC, the usual text storage method is to simulate a string array with one long string. Since strings can be of any length, you can store a list whose size is limited only by the machine's memory. But this standard method does not use memory efficiently.

Here's how an Atari BASIC simulation of a string array would store five names. We'll call the long string NAME$. Since a name (first and last) usually contains less than 20 characters, NAME$ should be DIMensioned to at least 100 (20 times 5) characters. But the string will have to be padded with exactly enough spaces to fill out the total number of characters that we DIMensioned—otherwise data from a program that was previously stored in memory could "leak" through. Then we place the names in the string, starting with the first name at NAME$(1,1), the second at NAME$(21,21), the third at NAME$(41,41), the fourth at NAME$(61,61), and the fifth at NAME$(81,81). Now we can easily find, say, the third element and print it with:

continued on next page

```
ENDPOS=3*20
? NAME$ (ENDPOS-19,ENDPOS)
```

The major disadvantage of this technique is that if any of the names are less than 20 characters long, space is wasted. You could reduce the space for each string item to 15 characters, but then longer names wouldn't fit. It's difficult to choose the most appropriate field size for items whose length varies.

Another not-so-efficient method might be to store items in DATA statements in consistent-sized groups (say, 10 items per statement). You could then locate items by using the RESTORE statement. The code and time to access a particular item is longer than in the previous method, but less space is wasted. Still, some space is wasted because of commas and the DATA in each line so this isn't the efficient method we are looking for.

INVERSE VIDEO FLAGS

Here's a better way:

Let's return to the method of using a string to store the list of items. We can solve the problem of wasted space by storing items one right after the other without a lot of spaces for padding. We need to mark the beginning location of each item, so we'll store each first character in reverse video. This is done simply by adding 128 to its ATASCII value. For an example, try this:

```
10 DIM CH$(5)
20 CH$="ANTIC":PRINT CH$
30 CH$(1,1)=CHR$(128+ASC
   (CH$(1)))
40 PRINT CH$
```

With inverse video flags, we can store a list of text items—each of which can be of any length, and it isn't necessary to fill out the string with spaces first. To locate item number X, search from the beginning of the string for the Xth inverse character. Find the length by searching up to the next inverse character. Since the last item isn't followed by an inverse character, we must place one there. To do this, use something like:

```
NAME$(LEN(NAME$)+1)=
CHR$(128)
```

We could have avoided having to store the final inverse character by storing the *last* character of each item as an inverse character instead of the first, but the code to locate and print an item would have been longer. Incidentally, Atari BASIC stores variable names this way.

SAMPLE STORAGE PROGRAM

Since a BASIC-only linear search of the string would be quite time-consuming, I've written a machine language routine to do this. Here's how you would use it to locate and print the tenth item in the string NAME$:

```
BEGIN = USR(ADR(FIND$),
ADR(NAME$),10)

LENGTH = PEEK(1)

? NAME$ (BEGIN,BEGIN+LEN-
GTH-1)
```

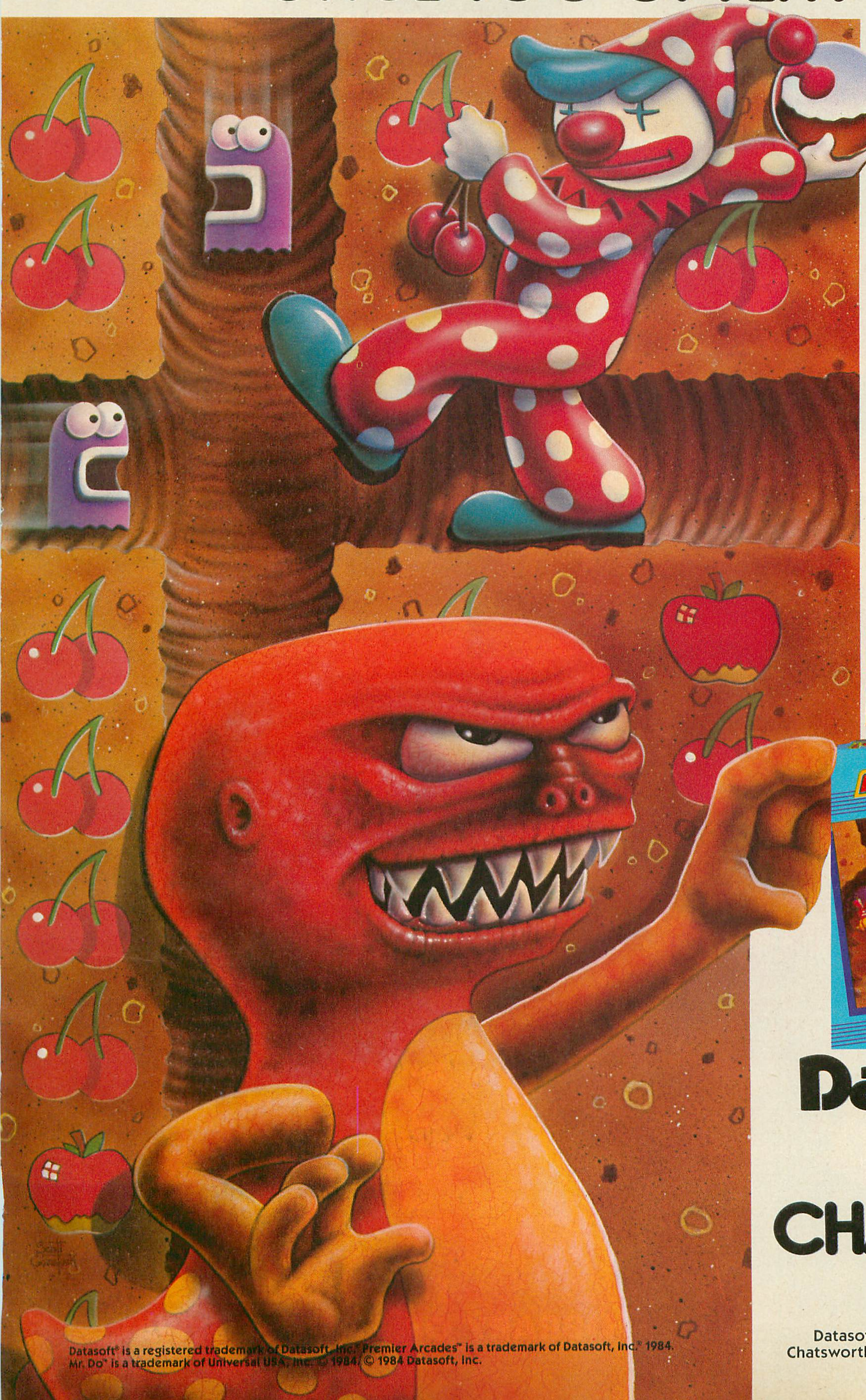
Calling the USR routine gives us two numbers: the starting location of an item, which is placed in the variable to the left of the equal sign (BEGIN in the above example); and the item's length, which is placed in memory location 1.

Listing 1 is a short sample BASIC program. Type it in and RUN it. You can enter as many items as you like, but the total sum length should not exceed 999 characters, and each item should be no longer than 100 characters. You can change this by DIMensioning NAME$ and N$ in the first program line to other sizes. First enter the number of items in your list, then enter the items one at a time. After you've entered the last item, the program prints out the entire storage string, then lets you print out individual items by entering the item's number. Listing 2, provided for your information, is an assembly language listing for the machine code used in Listing 1. You don't need to enter Listing 2 to use Listing 1.

Scott Sheck uses his Atari 400 to keep track of and print weekly statistics for his bowling leagues. He also writes game programs and utilities in BASIC and assembly language.

Listing on page 56.

HAS MR. DO™ CLOWNED AROUND ONCE TOO OFTEN?



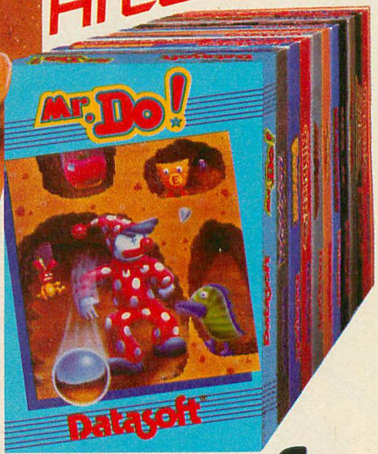
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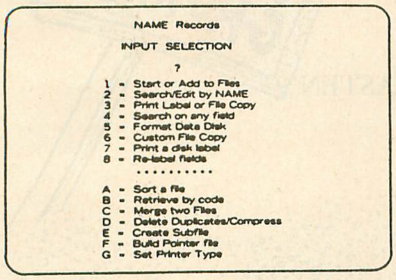
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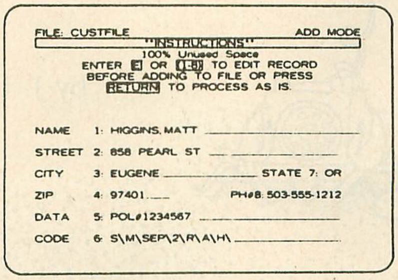
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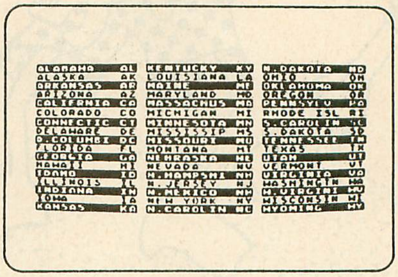
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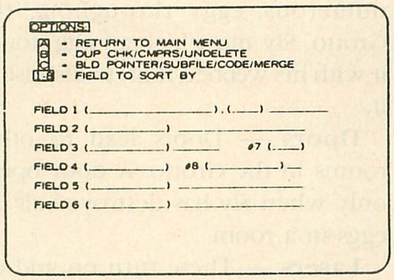
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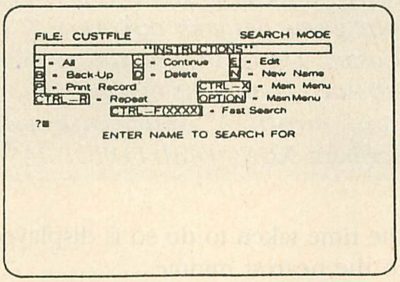
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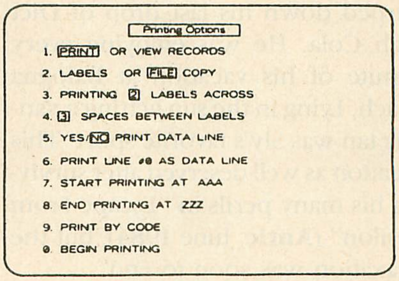
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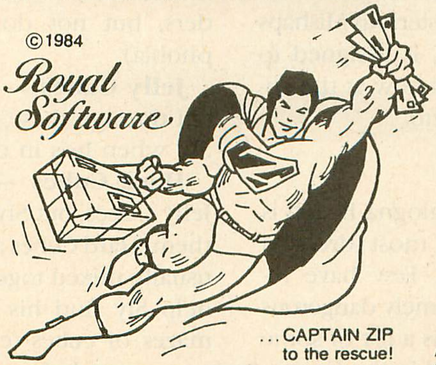
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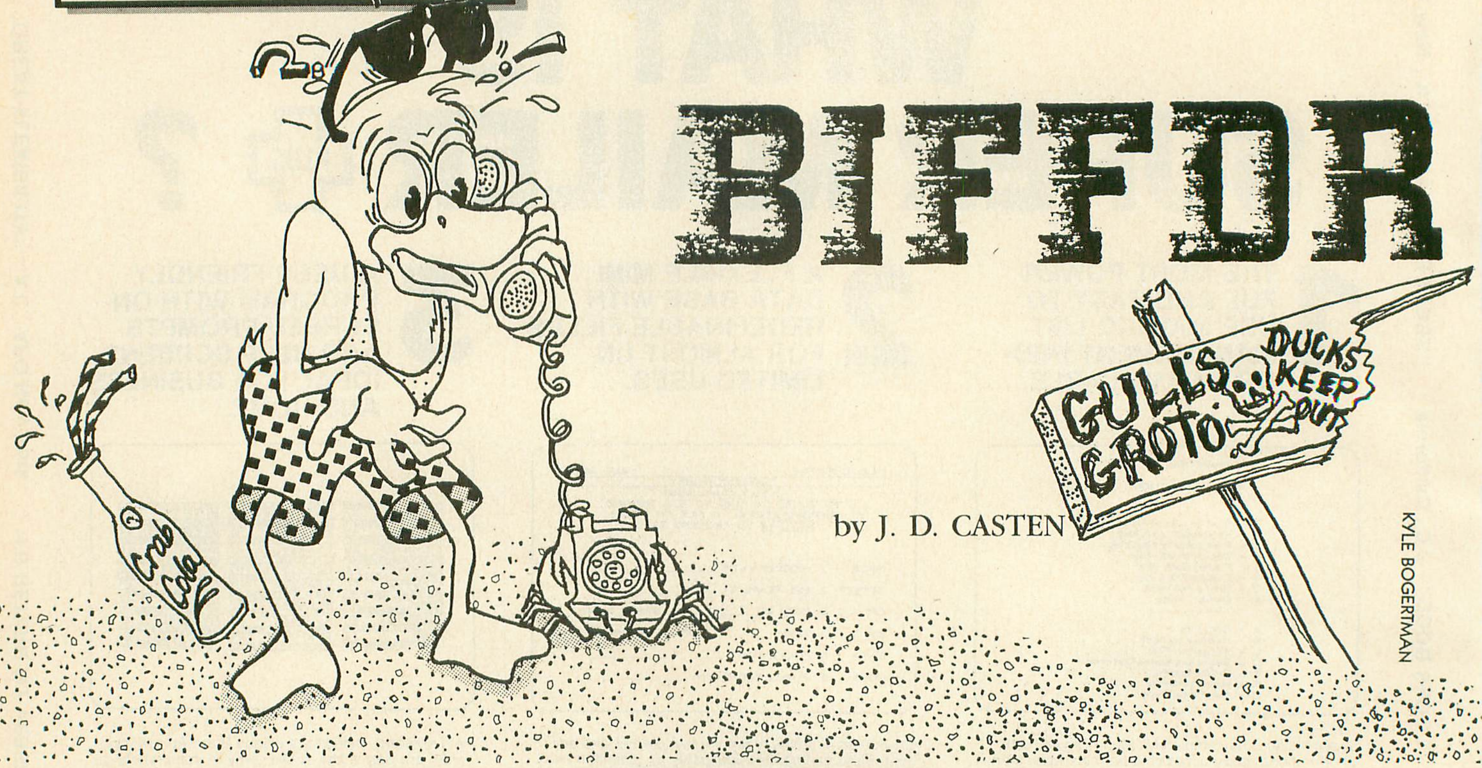
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BIFFDR

by J. D. CASTEN



A challenging and imaginative action-adventure game from Antic's star game designer discovery, J. D. Casten. The BASIC program runs on all Atari computers of any memory configuration. Antic Disk subscribers, RUN "D:BIFFDROP.BAS".

"Wow! This stuff really hits the spot," declared Slyvester Biffdrop as he slurped down his last drop of Diet Crab Cola. He was enjoying every minute of his vacation at Balogna Beach. Lying in the sun getting a xanthic tan was Sly's favorite sport. This vacation as well deserved after surviving his many perils in "Escape From Epsilon" (**Antic**, June 1984), but the relaxation was soon to end.

"Phone call for Mr. Biffdrop!" cried a small boy from a nearby pay phone. Sly quickly disposed of his Crab Cola bottle and ran to the phone.

"Hello," he panted.

"Hi Sly," a voice returned, "this is your Aunt Icked. Now listen, I didn't send you to Balogna Beach just so you could get a xanthic tan. Go down to Gulls' Grotto and get that ring back for the museum. Bye Sly." CLICK.

THE GAME

Type in Listing 1, check with TYPO, and SAVE a copy. Plug a joystick into port 1 and RUN the program. You start with five lives and gain an extra one for each room you successfully pass through. The game is over when Slyvester loses his last life or when he gets the ring. If he does get the ring, the time taken to do so is displayed to the nearest minute.

THE STORY SO FAR

Two weeks ago a flock of sea gulls had flown to the Icked Medfly Museum and stole a valuable ring. They're holding the ring for ransom at the infamous Gulls' Grotto. Slyvester Biffdrop, Inspector of Mysterious Mishaps for Icked Industries, is assigned to recover the ring. He's now at the entrance to Gulls' Grotto.

GULLS' GROTTO

One mile south of Balogna Beach is one of the world's most dreaded areas—Gulls' Grotto. Few have returned from this extremely dangerous series of caves. Here is a list of some items said to be found in the Grotto:

Gruesome Gulls — They fly throughout Gulls' Grotto. Their touch is deadly to Sly.

Eggs — The gulls have laid numerous eggs throughout the Grotto. Sly must kick an egg (touch it with his webbed foot) to dispose of it.

Doors — Doors lead to other rooms in the Grotto. A door opens only when Sly has destroyed all the eggs in a room.

Lasers — These turn on and off intermittently. One zap and it's goodbye Sly.

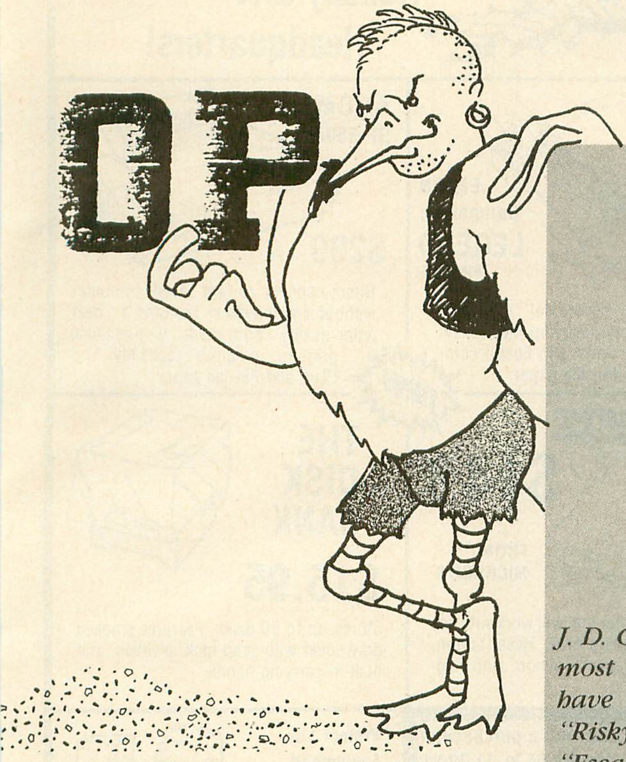
Spikes — Sly's experience in "Escape From Epsilon" has taught him that spikes are very sharp, and are deadly if fallen upon.

Ladders — Sly can climb up ladders, but not down (a hereditary phobia).

Jelly Cubes — Sly can walk and fall through these, but you can't see Sly when he's in one.

Hard Cubes — These look like Jelly Cubes, but Sly cannot penetrate them. Hard Cubes and Jelly Cubes are usually mixed together, so you must help Sly find his way through the mazes of cubes (counting footsteps sometimes helps).

The Ring — The ring is in the last room (room eight) of Gulls' Grotto.



Touch the ring, and you (and Sly) have won!

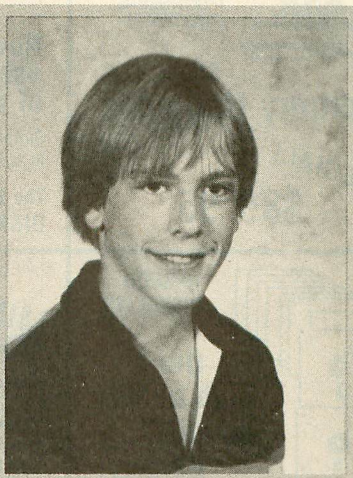
HINTS

Get to know Sly—test his limits to see just how much he can do. Sly is a duck and has wings, so he can fly to a limited extent while in midair. Practice controlling his jumps and falls. When you come to a new room, position Sly in a safe spot and figure out a strategy for that room. If you can't find a way to get through the room, have someone else take a look at the situation with a fresh point of view. It *is* possible to get the ring—please do not call **Antic** for the solution.

NOTE: Portions of this game listing use quite a few Atari special characters. So refer often to the Antic "Listings Conventions" page as you type in the program. Be especially on the lookout for the [CTRL][B] special character which prints out as a thick vertical line at the right of its space. In some settings this character can be hard to spot. For example, on line 580 the third inverse P follows a [CTRL][B] special character which wouldn't be hard to mistake for part of the P.

Listing on page 53.

J.D.



J. D. Casten is the author of the two most popular action games that have appeared in **Antic** *so far—"Risky Rescue" (April 1984) and "Escape From Epsilon" (June 1984). Last month we printed his first text adventure game, "Advent X-5." And this issue features "Biffdrop," his fourth game to appear in* **Antic** *during 1984.*

Antic's *star game programmer "discovery" lives in Eugene, Oregon and is a 16 year old high school senior. He plans to major in computer science at his hometown university.*

Readers of **Antic** *can look forward to Casten's biggest opus yet, "Operation Omega," a super expansion of "Escape from Epsilon." When Casten finishes the game, it will be his first major machine language program and contain nearly 750 scrolling screens.*

Starring in Casten's last two action games is the dauntless Slyvester Biffdrop (not spelled Sylvester). Unfortunately, when **Antic** *published "Epsilon" the author didn't inform us that Sly is a duck, so we illustrated the program with an Indiana Jones type hero. In "Operation Omega" Sly will be joined by a flying rodent named Oswald Dipthello.*

What makes J.D. Casten's games outstanding is their fast movement, smooth graphics and humorous plot backgrounds.

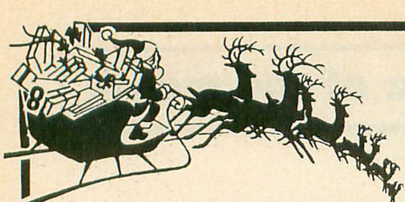
Casten is also working on his second text adventure game. But he won't turn it in until he's satisfied that the new parser recognizes words more sophisticatedly than "Advent X-5" did.

When he was 13 years old, Casten got his first computer. It was a Timex-Sinclair which he quickly upgraded to an Atari. At that time, he also bought the very first two issues of **Antic**. *He says the magazine showed him what a wealth of information was available for the Atari and that he could learn to program games.*

Casten's advice to starting programmers is to keep practicing and tinkering. "If you want to do it, you will," he says. "The information's there, you just have to use it."

Admittedly, Casten is a spurt programmer. When he's inspired he might work 12 hours straight and then finish a program in a week. But afterwards he might not do any more programming for a month. In his spare time, Casten reads science fiction and fantasy, plays quite a lot of Dungeons & Dragons.

And what do the initials J.D. stand for? John David. But everybody's been calling him J.D. for years.



COMPUTER PALACE



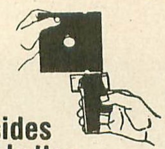
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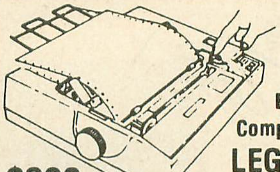


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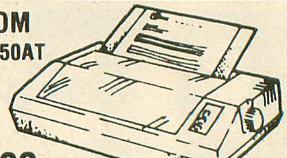
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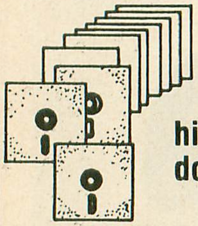


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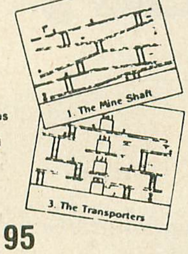
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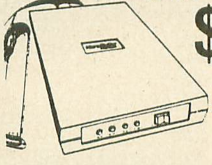


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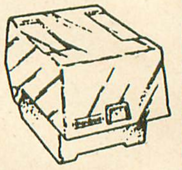
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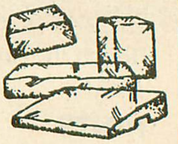
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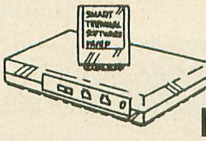
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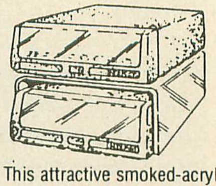
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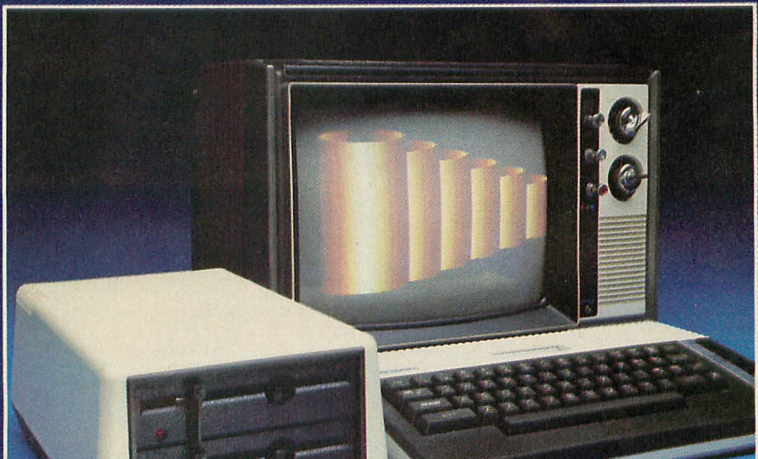
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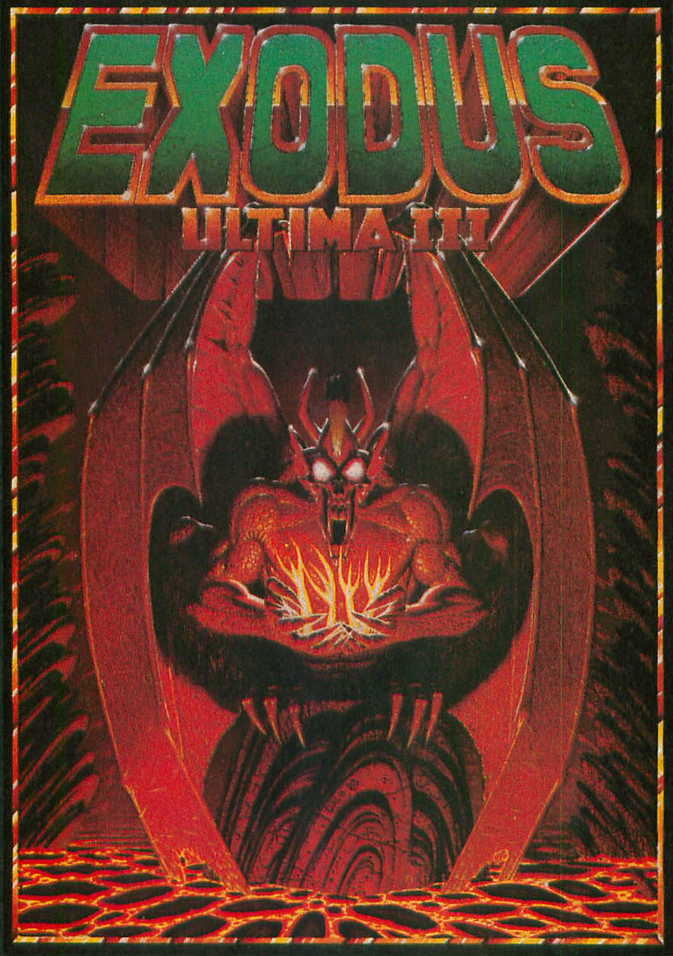
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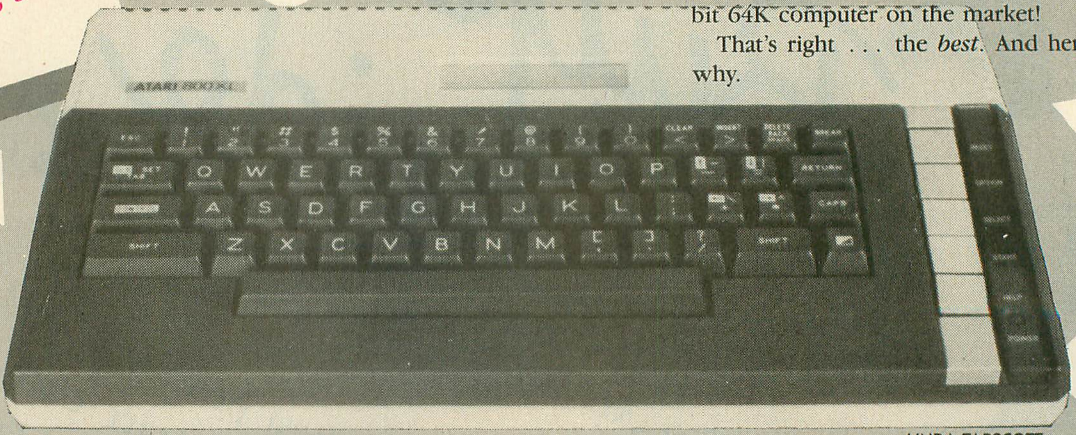
Here are over 125 best products—of all types—available for Atari computers during the 1984 Holiday Season.

In certain wide categories, such as printers, modems and video monitors, so many makes and models are compatible with the Atari that we're unable to conduct first-hand testing of every product on the market. Therefore, **Antic**'s picks in these categories are the best of the products with which we have direct experience.

continued on next page

Happy Holidays

A Hardware



LINDA TAPSCOTT

ATARI 800XL

If you're thinking of buying an Atari computer—or if somebody just gave you one—**Antic** has this message for you. Don't worry, you're getting the *best* eight-bit 64K computer on the market!

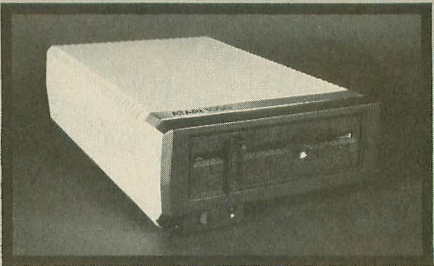
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Disk Drives

ATARI 1050

Our August Disk Drive survey called this the "no frills" drive because it is designed to simply read and write disks, with no digital readouts, no printer ports, no onboard bells and whistles. But it is a proven reliable performer that does its job well, supports single and enhanced density and is immediately compatible with all Atari software.

Atari Corp., 1265 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000. (1984 price not known at press time.)



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ATARI PRICES

According to all information we received from insider sources . . . Atari prices are going to be lower than ever, spectacularly low. Don't be surprised to find the 800XL computer on sale for under $160, and many top Atari software titles available for $10 to $20. We have little doubt that Atari products will be the best buys in the personal computer market through 1985. During Labor Day weekend sales we found the 800XL advertised for as low as $149.

INDUS GT

This highly reliable disk drive has a sleek high-tech look. The accompanying software package includes DOS XL, the GT Word Processor, and a spreadsheet program. The front panel offers a digital display and 4 buttons to give access to information about drive status. It supports single, enhanced and double density and comes in a compact carrying case.

$499.99. Indus Systems, 9304 Deering Avenue, Chatsworth, CA 91311. (800) 334-6387; in California (800) 544-6387.

Printers

TRANSTAR 120

This daisy-wheel printer by Vivitar turns out excellent letter quality type at 14 characters per second. But because of its Diablo code configuration, Letter Perfect is the only Atari word processor it's compatible with (unless you re-program it in BASIC). Still, it's a very good value, rugged, full-featured, quiet and so small it's almost portable. Parallel interface and friction feeding are standard, tractor optional.

$378. Winslow Sales, 2120 116th N.E., Bellevue, WA 98005. (800) 821-6349.

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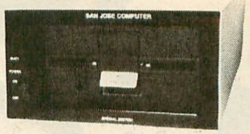
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Sept. '83	Education, P/M Tutor	8/35K	☐	☐
Oct. '83	Sports Games, AutoCassette	10/52K	☐	☐
Nov. '83	Sound & Music, Air Raid	9/51K	☐	☐
Dec. '83	New Product Guide, Robots	13/60K	☐	☐
Jan. '84	Printers, Screen Dump	12/54K	☐	☐
Feb. '84	Personal Finance, Gantlet	12/64K	☐	☐
Mar. '84	Worldwide Users, DiskRead	14/60K	☐	☐
Apr. '84	Risky Rescue, Math Wizard	15/59K	☐	☐
Ma/Ju '84	New XLs, Epsilon Escape	10/54K	☐	☐
July '84	Plato, Telecomputing	6/38K	☐	☐
Aug. '84	Disk Drives, Horsplay	6/67K	☐	☐
Oct. '84	4/5 Animator, Bouncing Ball	9/63K	☐	☐
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All Atari models are based on the 6502 microprocessor, the same chip used in the Apple II series and the Commodore 64. In fact, the 64K Atari 800XL has virtually the same amount of memory as either of these other two machines.

But in addition to the 6502, the Atari also has three specialized microprocessor chips—more than either Apple or Commodore—which deliver better all-around performance. These microchips and their specialties are: ANTIC for graphics, GTIA for video display, POKEY for sound and keyboard control.

The Atari does things with ease that other computers *still* can't handle. For example, Atari's fine scrolling graphics are unmatchable by the Apple II. Atari has 14 different graphics modes, far more display styles than the Commodore.

This list of Atari's outstanding capabilities goes on and on . . . Atari sound can reproduce four-voice musical compositions. Atari has one of the best screen editing systems around. All Atari models are upward-compatible—virtually all software for the earliest 400 model will work on every model through today's 800XL.

If you'd like independent testimonials . . . the Atari is the favorite personal computer of many (maybe even most) superstar programmers. Some names include: Bill Budge, creator of **Pinball Construction Set**; Anne Westfall, **Archon I & II**; Steve Gibson, **Apple & Atari Light Pens**.

The blunt truth is that because of the computer marketing ineptitude of the Atari company's former owners, a superb series of machines never got the wide respect they deserved. But it's hard to imagine that Atari will continue to be the "Rodney Dangerfield" of personal computers after the 1984 holiday buying season. Not when Atari Corp. is now being run by the toughest and most successful executive in the history of computer mass merchandising, Jack Tramiel.

Tramiel may never win Mr. Nice Guy awards with his oft-quoted "business is war" approach, but he built Commodore into the dominant force in inexpensive personal computers and he's out to knock his old company out of the #1 spot with Atari.

Note: There seems no danger of the 800XL line being discontinued as long as eight-bit 16K technology is still marketable. But the less popular 600XL, with only 16K memory, is not going to remain in production. So with the discount prices at which Atari products will be available this season (see Introduction to Buyer's Guide) we can't honestly recommend anything else but the 800XL.

Even the October, 1984 *Consumer Reports* called the Atari their "preferred system."

Approximately $160. Atari Corp., 1265 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000. (1984 price not known at press time.)





GEMINI 10X DOT MATRIX PRINTER

The Gemini 10X, one of the lowest priced dot matrix printers on the market, has no shortage of features. It offers both friction and adjustable-width tractor feed and a print speed of 120 characters per second. It has seven international character sets plus custom set download capability with control codes almost completely compatible with the Epson FX-80.

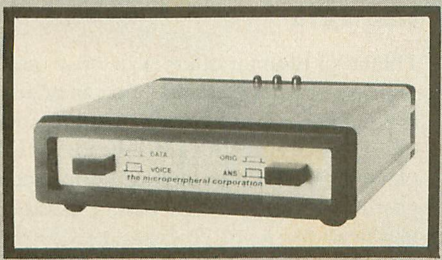
$299 average. Star Micronics, #3 Oldfield, Irvine, CA 92714. (714) 768-4340. Requires Atari 850 or parallel interface device.

Interfaces

MPP 1150 PRINTER INTERFACE

Microbits Peripheral Products has established a good reputation for reliability with their Atari peripherals. If you don't have the rare and elusive Atari-built 850 interface, and you own a parallel printer such as an Epson or Gemini, you will need the 1150. It plugs directly from your printer to the peripheral daisy chain and includes a peripheral outlet so that it does not have to be the last item on the chain.

$99.95. Microbits Peripheral Products, 225 W. 3rd Street, Albany, OR 97321. (503) 967-9075. Works with all Atari computers.



Buffers



QUADRAM MICROFAZER

The Quadram Microfazer may sound like a kitchen appliance for Darth Vader, but it is actually a printer buffer which will eliminate those frustrating pauses as you wait for that twenty-five page masterpiece to printout. The microfazer comes in various memory sizes. Three are listed below. When choosing, figure on 2K per printed page.

$179/8K, $299/64K, $1,395/512K. Quadram Corporation, 4355 International Blvd., Norcross, GA 30093. (404) 923-6666.

continued on next page

Buffers continued



INTERFAST-1

The Interfast-1 is a programmable printer interface with 4K RAM for use as a printer buffer or as storage for custom character sets. A software utilities disk is included which allows for downloading character sets into the Interfast-1 and using those character sets with your word-processing program (or other software) and graphics printer. It provides a Centronics parallel interface. Used as a buffer, it stores about two text pages.

$129.95. Advance Interface Devices, P.O. Box 2188, Melbourne, FL 32901. (305) 242-2772.

Memory Expansion

ATR8000

This is the only machine bringing CP/M and MS-DOS compatibility to the Atari. With the ATR8000, you can run software for the IBM and dozens of other PCs on your Atari.

$599.95, 64K ATR8000 with CP/M. $400, add-on MS-DOS board. SWP Microcomputer Products, 2500 E. Randol Mill Road, Suite 125, Arlington, TX 76011. (817) 469-1181.

MICRORAM 64K MEMORY EXPANSION BOARD

Quadruple your 600XL's memory capacity with a 64K memory expansion board and kiss those ERROR 2's goodbye! With 64K at your fingertips, you can add a disk drive to your computer, play more games and run longer programs. The board, about the size of a paperback book, simply plugs into the back of your 600XL.

$149.95. Microbits Peripheral Products, 225 W. Third Street, Albany OR 97321. (503) 967-9075.

TINY TEK 48K MEMORY BOARD

While this has been around for some time, it's good to know about it if you have an Atari 400. With 48K of memory you can use a lot more software. The 48K board must be soldered to your Mother Board and Tiny Tek recommends that a technician do this.

$89.95. Tiny Tek, Route 1, Box 795, Quinlan, TX 75474. (214) 447-3025.

AXLON 128K RAMDISK

This is a hardware board that's easily installed in your Atari 800 computer without soldering. Just plug the board into slot 3, run the included software, and you've got 128K accessible as disk drive number 4. You can do anything with this simulated drive that you'd do with a standard one, except the Ramdisk is even faster (but naturally it won't save your files when the computer is shut off).

$299. Axlon, 1287 Lawrence Station Road, Sunnyvale, CA 94089. (408) 747-1900. Requires Atari 800, DOS 2.0 and one disk drive.

Monitors

SEARS PROFORMANCE TV/MONITOR

Antic wanted to review a video display that readers could be pretty sure of finding anywhere in the U.S. This Sears 13-inch set will adequately do anything you'd expect from either a TV or a monitor, so it's a good deal at $349.99. We particularly like the green screen setting for our word processing work. Unfortunately, our test unit had a distracting color ghost which Sears didn't get around to helping us fix before press time. So if you buy one, don't throw away the packing box till you check out the set with your Atari.

$349.99 Sears Department Stores and Business Systems Centers.

AMDEK 300A

This amber monochrome monitor makes for easy reading, especially when one is doing a lot of word processing or database entry. We use this here at **Antic** with a model 800 computer and our busiest letter-quality printer. It does the job well.

$199. Amdek, 2201 Lively Blvd., Elk Grove Village, IL 60007. (312) 364-1180.

NEC 1215

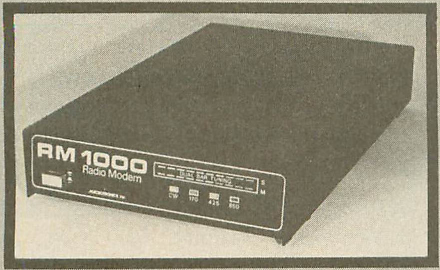
This color monitor offers clear, crisp hues with equally good sound. You can adjust the brightness, color, tint, volume and sharpness. At **Antic** it's a favorite for game-playing. (Note: Color monitors don't support 80 column screens well, a possible handicap for word processing.)

$399. NEC Home Electronics, 1401 Estes Avenue, Elk Grove Village, IL 60007. (312) 228-5900.



Modems





RM1000 RADIO MODEM

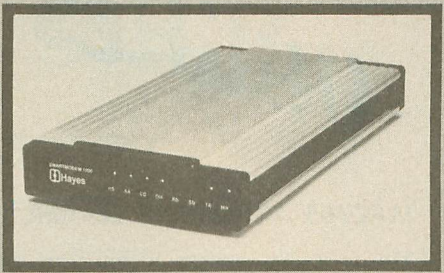
This unique modem translates radioteletype and Morse Code messages to English on your Atari. It connects a ham radio and a computer. You'll need the RM400 software/cabling package ($59, disk). Included are high-grade noise filters, excellent documentation and superb design.

$239. Macrotronics, Inc. 1125 N. Golden State Blvd., Suite G, Turlock, CA 95380 (209) 667-2888.

VOLKSMODEM

This 300-baud, direct-connect modem with its lifetime guarantee is an excellent deal. The simple, no-frills Volksmodem draws power from the phone line. You'll need a "C" cable ($12.95 from Anchor) to connect to the 850 interface, or the "F" cable ($39.95 from Anchor) to connect to joystick port 2.

$79.95. Anchor Automation, 6913 Valjean Avenue, Van Nuys, CA 91406. (808) 997-6493.



SMARTMODEM 1200

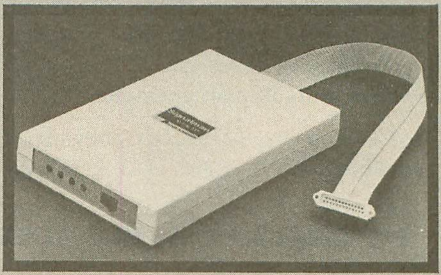
An industry standard, Hayes offers solid construction, direct connection, automatically adjusted baud rate, an internal speaker, auto-answering and the best documentation around. You can use it with radioteletype, as a data line monitor, as a local network. Or you can configure internal DIP switches to suit any of your needs.

$699. Hayes Microcomputer Products, 5835 Peachtree Corners East, Norcross, GA 30092. (404) 449-8791.

MPP-1000C

Unlike other direct-connect modems, the 300 baud MPP-1000C plugs into a joystick port, requiring no 850 interface. It comes with a Smart Terminal cartridge, which allows uploading, downloading, auto-dialing, auto-answering and x-modem protocol. Well documented, this is a good buy. Works with Atari's Plato cartridge too.

$149.95. Microbits Peripheral Products, 255 W. Third Street, Albany, OR 97321. (503) 967-9075.



SIGNALMAN MK XII

An excellent "smart modem," the Mark XII is a direct-connect, multiple-baud modem with auto-dial, auto-answer, status lights and good documentation. A Hayes competitor, the Mark XII's output is an RS-232 ribbon. You'll need an RS-232-to-DB9 cable (about $22) and a female/female gender changer ($25) to connect to the 850 interface.

$399. Anchor Automation, 6913 Valjean Avenue, Van Nuys, CA 94106. (818) 997-4593.

Joysticks

STARFIGHTER

This sturdy, easy-handling joystick has a square base and a short, wide stick with a rounded top. You definitely hear a "click" when contact is made. It's a joystick that gets a lot of use by the **Antic** staff.

$10.95. Suncom, Inc., 260 Holbrook Drive, Wheeling, IL 60090. (312) 459-8000.

COMMAND CONTROL THREE-WAY JOYSTICK

This joystick lets you switch handles to fit the game you're playing. You can press a button on top of any of the three handles or on the base of the joystick. According to **Antic** Pix Controllers (Dec., 1983) "they know how to build a stick to last."

$32.95. Wico, 6400 W. Gross Point Road, Niles, IL 60648. (312) 647-7500.



continued on next page

Miscellaneous Atari Software Utilities

S.A.M.— THE SOFTWARE AUTOMATIC MOUTH

S.A.M. is a voice synthesizer on a disk that sounds just about as good as the much more expensive "black box" voicemakers. S.A.M. is fun, flexible, and easy to use. You can add speech to your own BASIC and machine language programs. S.A.M. has a good manual. It uses only 9K memory and works with all Atari computers.

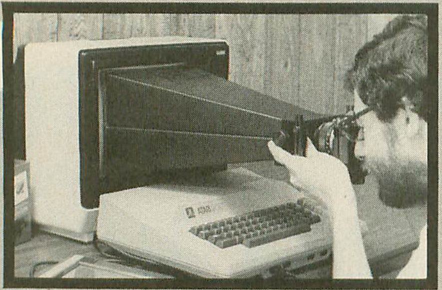
$59.95. Tronix, 8295 S. La Cienega Blvd., Inglewood, CA 90301. (213) 215-0529.

3M FORMED PANEL FILM FILTER

Anyone who sits in front of a monitor or TV display for more than an hour a day could use a glare screen to ease eye strain and improve contrast on your screen. This filter works better and costs half of other models we've seen. Its only drawback: you must remove the shell around the monitor's tube to install it.

$45.33 for non-standard size works for most monitors; price varies depending on size of monitor. Industrial Optics, 3M, 223–4W, 3M Center, St. Paul, MN 55144. (312) 496-6500.

SCREENSHOOTER



Screenshooter is a cone that comes with a Polaroid One-Step camera and a special mount bracket (which will also accommodate most 35mm cameras). Simply press the cone against the monitor screen, snap the shutter and within seconds you have a Polaroid print of your favorite Micro Illustrator picture or anything else you choose.

$169. NPC Photo Division, 1238 Chestnut Street, Newton Upper Falls, MA 02164. (617) 969-3487.

MAC/65 ASSEMBLER EDITOR

This is it. No contest. If you want an assembler editor, MAC/65 is the one to buy, and if you don't believe us, pick up **Antic** October, 1983 and read what David and Sandy Small have to say in "Nightmare Mission." MAC/65 is compatible with the Atari Assembler Editor as long as you limit yourself to what the Assembler Editor can do. MAC/65 is more powerful and much faster in compiling. It's available in both disk and cartridge. Both versions contain excellent debuggers.

$80, disk; $99, cartridge. Optimized Systems Software, 1221-B Kentwood Avenue, San Jose, CA (408) 446-3099. Disk requires 48K, cartridge 16K.

ULTRA DISASSEMBLER

Ultra Disassembler is primarily aimed at the advanced programmer who is proficient in assembly language. As its name implies, it will disassemble binary object code into source code. Ultra Disassembler is considered by many to be the best of its kind. It can disassemble from disk files as well as from memory and it can also disassemble from disk sectors. The resulting source code will contain the Atari OS labels. Keep in mind, however, that no disassembler can recreate the original source code. Ultra Disassembler cannot accurately decode text strings or data tables and it will take some expert knowledge of assembly language to fully decipher the listings.

$49.95. Adventure International, P.O. Box 3435, Longwood, FL 32750. (305) 862-6917. Requires disk and 32K (48K recommended).

ACTION!

Action! is the amazingly fast language in the orange cartridge, a happy marriage of Pascal and C. Action! was designed specifically for the Atari. The language contains a screen editor that's superior to many word processors and makes programming a joy. Action! may be the most exciting thing to happen to the Atari since the GTIA chip.

$99. Optimized Systems Software, 1221-B Kentwood Avenue, San Jose, CA 95129. (408) 446-3099. Cartridge, can be used with disk or cassette.

MMG BASIC COMPILER

Converts your BASIC programs into binary machine language files that will run up to 15 times faster than the original. Unlike other compilers, MMG will also produce assembly source code which you can alter and analyze. You can choose between integer and floating point arithmetic and can put your data statements anywhere. It's available in both double and single density.

$99.95. MMG Micro Software, P.O. Box 131, Marlboro, NJ 07746. (201) 431-3472. Requires 48K, disk and BASIC.

LISTER PLUS PICTURE PLUS

These two utilities (sold separately) can stretch your dot-matrix printer to its limits. Lister Plus, among many other things, will permit you to dump any listed file (including programs) to the printer using any custom character set you choose. Picture Plus will let you manipulate various types of picture files (including Micro Painter and Micro Illustrator). You *can then save* them in a standard file that can be used with a BASIC program, or dump them to the printer in any of four sizes.

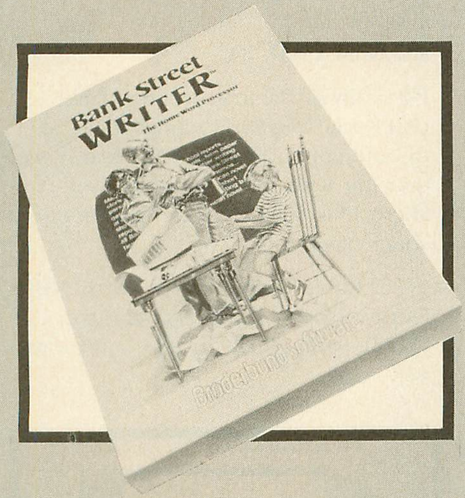
$19.95, Lister Plus. $29.95, Picture Plus. Non-Standard Magic, P.O. Box 45, Girard, OH 44420. (216) 539-6033. 48K—disk, requires BASIC.

Word Processing

BANK STREET WRITER

Especially created for home use, Bank Street Writer lets beginners simply sit down and write. While you do have to switch between write and edit modes, prompts are always available and editing functions are easy to grasp. Especially recommended for students and those whose writing needs are on a small scale. For them, this program could be the best.

$69.99. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170. 48K—disk.



LETTER PERFECT, V. 6
SPELL PERFECT, V. 1

Moving from edit to print and other modes, as well as moving throughout your document is a breeze with Letter Perfect. You can chain files, but not move text from one file to another. This software runs easily with a variety of printers and will support an 80-column board on the Atari 800. It includes a spelling checker of approximately 30,000 words, which does a good job quickly. But if you want a larger dictionary to which you can either add or delete words, you will want Spell Perfect. **Antic** uses Letter Perfect . . . constantly!

$99.95, Letter Perfect; $79.95, Spell Perfect. LJK Enterprises, Inc., 7852 Big Bend Blvd., St. Louis, MO 63119. (314) 962-1855. Each requires 32K—disk.

WRITER'S TOOL

Here's a full-power word processing system that uses either disk or memory-saving cartridge. It has the usual features such as overstrike, insert, search and replace (which seemed to call for too many key presses). Some very nice extras include cursor movement with the arrow keys alone, an automatic switch between upper and lower case, a mail merge function. Documentation is good and has a helpful index.

$129.95. OSS, 1221-B Kentwood Avenue, San Jose, CA 95129. (408) 446-3099. 48K—disk or cartridge.

ATARIWRITER

This easy word processing system allows you up to 14 double-spaced pages of text in one file. You write in insert mode only. Setting margins is easy. It's menu-driven, has a full-page print preview, and losing your text is difficult.

Atari Corp., 1265 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000. 16K—cartridge. (1984 price not known at press time.)



LETTER WIZARD
SPELL WIZARD

Formerly Text Wizard, Letter Wizard offers a full range of word-processing capabilities. It's menu-driven and a status line at the bottom of the screen lets you know what's happening at all times. The program is compatible with a variety of printers and offers nice features such as letting you easily begin and end printing on specific pages. The associated dictionary program, Spell Wizard, is compatible with all Atari DOS files which is a great convenience.

$74.95 each. Datasoft, 19808 Nordhoff Place, Chatsworth, CA 91311. (800) 423-5916; in California (818) 701-5161. 32K—disk.

Business

DATA PERFECT

This powerful database comes from the same company that makes the Letter Perfect word processor—so it's no surprise that the two programs are compatible. While not as easy to learn as SynFile+, Data Perfect has better report writing and global change capability. Works best with two disk drives.

$129.95. LJK Enterprises, Inc., 7852 Big Bend Blvd., St.Louis, MO 63119. (314) 962-1855. 32K—disk.



SYNFILE+
SYNCALC
SYNTREND
SYNSTOCK

This series of compatible 48K disks is the most complete business applications package currently available for the Atari.

SynFile+ ($79.95) is a powerful database system that's easy to use. But it has limited report generating ability. Like the rest of the series, it can transfer files to AtariWriter.

SynCalc ($79.95) is the best Atari spreadsheet on the market. It can share files with VisiCalc and other members of the Syn Series. Like SynFile+, it uses pop-up menus and simple commands.

SynTrend ($79.95) includes SynStat for statistical analysis and SynGraph for making business charts easily.

SynStock ($59.95) displays charts of your stock market holdings for technical analysis, prints out the data and even acts as software for downloading stock quotes from CompuServe.

Synapse Software, 5221 Central Avenue, Richmond, CA 94804. (415) 527-7751.

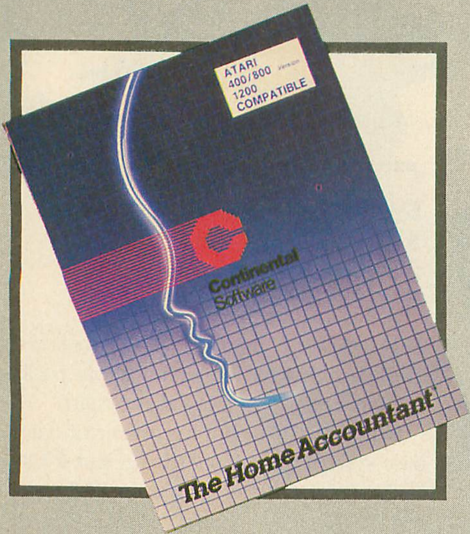
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Financial

HOME ACCOUNTANT TAX ADVANTAGE

These popular packages have been around a while on many different computers. Menu-driven Home Accountant ($74.95) tracks five checkbooks, makes balance sheets and forecasts, displays graphs. It can even print checks, a highly useful feature for professionals and small businesses that don't need a full accounting system. Compatible with Tax Adantage ($69.95), which does year-round tax planning and then prints out your Form 1040 line-by-line—make sure you have the 1984 edition.

Continental Software, 11223 South Hindry Avenue, Los Angeles, CA 90045. (800) 421-3930; in California (213) 410-3977. 48K—disk.



COMPLETE PERSONAL ACCOUNTANT

This 3-disk program seems useful for someone operating a small business or who is fascinated with keeping highly accurate, detailed home records. You'll find a chart of accounts, multiple checkbook balancing, budget analysis, figuring your net worth and more. As with most financial programs, be prepared to put some time into entering the data.

$79.95. Futurehouse, Inc., 310 W. Franklin Street, Chapel Hill, NC 27514. (919) 967-0861. 48K—disk.

Typing Tutors

TYPO ATTACK

Here's the program that lets you practice your typing while playing an action-packed game. Invading creatures fall towards your bases; hit the right key and save the base.

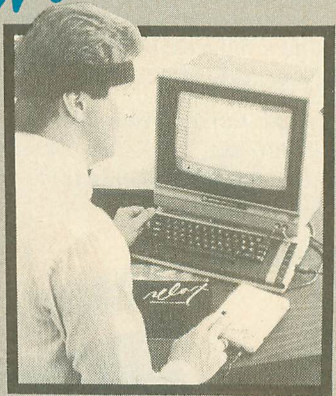
Atari Corp., 1265 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000. 32K—disk. (1984 price not known at press time.)

WIZTYPE

More than typing practice, WizType teaches you proper finger positioning on the keys and lets you work up to the amusing typing game. With an editor you can create your own typing lessons, which is a real plus. The "Wizard of Id" comic strip characters are entertaining.

$34.95. Sierra-on-Line, P.O. BOX 485, Coarsegold, CA 93614. (209) 683-6858.

Self Improvement



RELAX

The first bio-feedback unit for the Atari to reach the market has a headband with three sensors that measure your stress level by monitoring the muscle tension in your forehead. Included software displays your relaxation scale, lets you control kaleidoscope patterns and float a balloon image. People who see Relax in action are usually fascinated by it.

$139.95. Synapse Software, 5221 Central Avenue, Richmond, CA 94804. (415) 527-7751. 16K—disk.

SPEEDREAD+ MEMOREASE+

Increase your reading speed with this excellent and well-documented program. SpeedRead+ ($64.95) improves eye movement, character and word recognition, and peripheral vision. MemorEase+ ($79.95) seeks to increase memory retention by adding the Atari's graphic abilities to rote memorization practice.

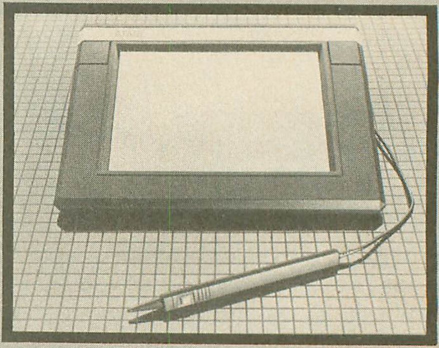
Inet Corporation, 536 Weddell Drive, Sunnyvale, CA 94086. (415) 797-9600. 16K—disk.

Touch Tablets

KOALA PAD

Physically similar to Atari Touch Tablet, except KoalaPad is small enough for an adult to hold comfortably in one hand while drawing with the other. Also uses easy Micro Illustrator software like the Atari Touch Tablet.

$125. Koala Technologies Corp., 3100 Patrick Henry Drive, Santa Clara, CA 95050. (408) 986-8866. 32K—cartridge, 48K—disk.

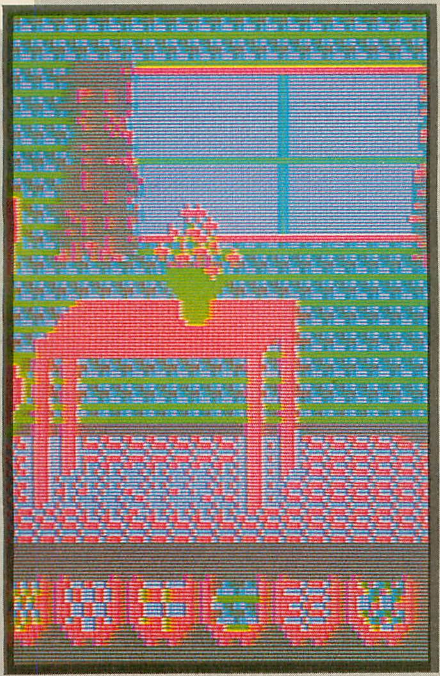


ATARI TOUCH TABLET

The stylus has a built-in button controller and won't get lost because it's attached by cable to the sturdy tablet. The tablet couldn't be easier to handle. Cartridge runs the powerful, easy-to-use Micro Illustrator software (under AtariArtist brand name).

$89.95 (1983 list price). Atari Corp., 1265 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000. 32K—cartridge. (1984 price not known at press time.)

Graphics



PAINT

One of the best joystick paint programs. You can choose among literally hundreds of color and pattern "pots." Zoom feature. Uses Graphics 7, a medium-resolution 4-color mode. Excellent 147-page manual.

$39.95 (1983 list price). Atari Corp., 1265 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000. 48K—disk. (1984 price not known at press time.)

GRAPHIC MASTER

Specializes in creating, manipulating and editing images for graphic layouts. Draw with joystick or select from menu of shapes. It zooms, rotates images in windows, and is the only graphics software with built-in printer dump.

$34.95. Datasoft, 19808 Nordhoff Place, Chatsworth, CA 91311. (800) 423-5916; in California (818) 701-5161. 40K—disk.

MICROPAINTER

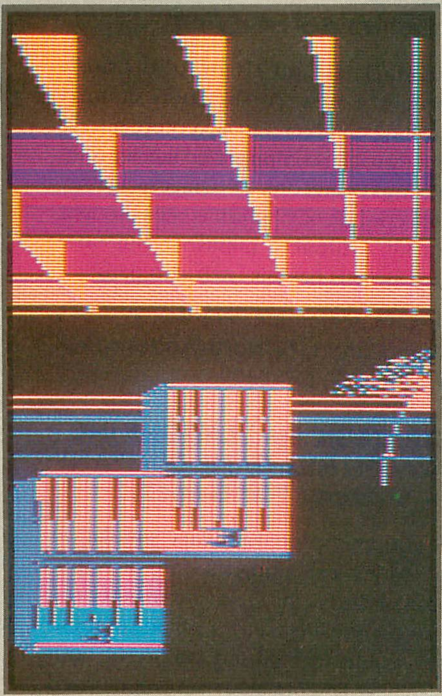
This widely-used originator of joystick drawing software established the graphics file storage standard for Atari. Uses Graphics 7-1/2 high-resolution four-color mode. Easy drawing and pattern fill.

$34.95. Datasoft, 19808 Nordhoff Place, Chatsworth, CA 91311. (800) 423-5916; in California (818) 701-5161. 48K—disk.

MOVIEMAKER

Create "movies" up to 300 frames long with this computerized animation studio. Add music, sound and title screens. It's menu-driven through four phases of combining shapes on-screen.

$60. Reston Software, 11480 Sunset Hills Road, Reston, VA 22090. (800) 336-0338. 48K—disk.



FUN WITH ART

Use all 128 Atari colors in a single picture by easily manipulating video "scan lines." Load two pictures and transfer parts between them. Move around parts of a picture. Uses Graphics 7-1/2.

$39.95. Epyx, 1043 Kiel Court, Sunnyvale, CA 94086. (408) 745-0700. 32K—cartridge.

TECH-SKETCH LIGHT PEN

The package includes Micro Illustrator software for powerful drawing and pattern filling flexibility. The sturdy light pen has a control switch mounted on the barrel, making control even easier. Paint directly on your video screen.

$59.95. Tech Sketch, Inc., 26 Just Road, Fairfield, NJ 07006. (800) 526-5214. 48K—disk.

On-line Services

Contact individual companies for latest information on membership fee and hourly rates. You'll need a modem to hook up.

COMPUSERVE

Probably the leading on-line information service, CompuServe offers stock quotes, news, weather, games, "Citizens Band" real-time bulletin board, shopping, and special interest groups on dozens of topics—including a highly active Atari SIG with hundreds of downloadable programs.

5000 Arlington Center, Box 20212, Columbus, OH 43220. (614) 457-8600, (800) 848-8199.



PLATO

The last word in on-line education, Plato offers over 2,000 hours of structured lessons, as well as games, electronic mail, graphics database and discussion files. You'll need the Learning Phone cartridge from Atari.

Contral Data Publishing Co., P.O. Box 261127, San Diego, CA 92126. (800) 233-3784; in California (800) 233-3785.

DIALOG Knowledge Index

This is the most complete collection of on-line commercial databases—specialties are technology, business, news and microcomputers. Fairly complex and expensive, mostly for professionals.

3460 Hillview Avenue, Palo Alto, CA 94304. (800) 227-1927, in California, (415) 858-3785.

continued on next page

Games

GAME BRANDS YOU CAN TRUST

In order to fit the greatest number of deserving game products into this 1984 Buyers Guide, we're going to single out some of the most popular entertainment software by entire product line. If you like the types of games described below, you probably cannot go wrong when you choose *any* title from these publishers . . .

More often than not, you'll need 48K memory and a disk drive to use these games. Prices will probably fall between $30 and $60.

INFOCOM — Text Adventures

This is the consistently best-selling line of all-text adventure games. There should be close to 15 Atari titles available by Christmas. Themes range from detective mysteries (**The Witness, Deadline**) to science fiction (**Planetfall, Starcross, Suspended**) and "Indiana Jones" settings (**Infidel**).

Antic staff favorites tend to be the pure fantasy worlds, which seem to lend themselves best to playing imaginatively with interactive fiction (the classic **Zork** trilogy, **Enchanter, Sorcerer**). There's even a new category of easier but still challenging adventures for younger or less experienced players (**Seastalker**).

Infocom, Inc., 55 Wheeler Street, Cambridge, MA 02138. (617) 492-1031.

ULTIMA — Graphics Role-Playing

Ultima I, II and **III** by Lord British brought a new combination of map scrolling graphics and adventure puzzle solving to the computerized fantasy role-playing Dungeons & Dragons game. Each episode of Ultima has been brought out by a different publisher, but now Lord British has his own company.

Origin Systems, Inc., P.O. Box 99, 1545 Isgood Street, #7, North Andover, MA 08125. (617) 681-0609.

STRATEGIC SIMULATIONS INC., AVALON HILL GAME COMPANY — Strategy War Games

If you ever played military simulation board games, taking the role of Napoleon or the Pacific Fleet Commander, the games probably came from one of these two publishers. SSI and Avalon Hill both also have large catalogs of computerized strategy games that simulate major battles from every historic age and on into the realm of science fiction (**Epidemic**).

These companies are starting to diversify into other kinds of games a bit. For example, SSI has a good scrolling fantasy game, **Questron**, that's somewhat easier than the Ultima series.

Strategic Simulations Inc., 883 Stierlin Road, Bldg. A-200. Mountain View, CA 94043. (415) 946-1200.

Avalon Hill Game Company, 4517 Harford Road, Baltimore, MD 21214. (301) 254-5300.

MASK OF THE SUN

This is a graphics/text adventure set in Central America. You are Mac Steele searching for the mask, while frantically trying to stay alive. Like all great interactive adventures, there are hidden doors, suspicious people, treasure and puzzles.

$39.95. Broderbund, 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170. 48K—disk.

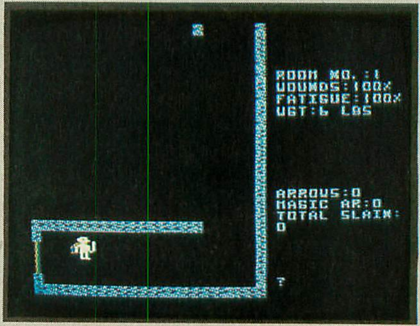
SEVEN CITIES OF GOLD



You're a conquistador exploring the New World in one of the best role-playing simulations ever. You try to find your way across a 120-foot map of unknown territory by looking through a movable 3-1/2 inch window. You can encounter over 200 native villages and Inca or Mayan cities. Will you try to trade peacefully or plunder their gold by force?

$40. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. (415) 571-7171. 48K—disk.

TEMPLE OF APSHAI



Enter the temple and you're in a classic Atari game. Start by consulting with the Innkeeper and equipping yourself. Then enter the dungeon in search of treasures, monsters, and adventure. The screen shows a top-down view of the dungeon, with status and options displayed on the side.

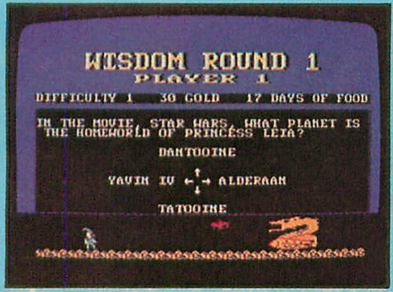
$40. Epyx, 1043 Kiel Court, Sunnyvale, CA 94089. (408) 745-0700. 32K—disk.

SURVIVAL OF THE SMARTEST . . .

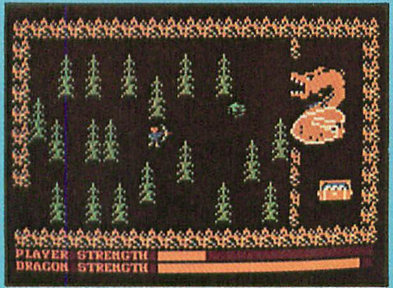
EXCITING, NEW & DIFFERENT!

Outsmart your Friends. Outwit the Dragon. Join the Quest.

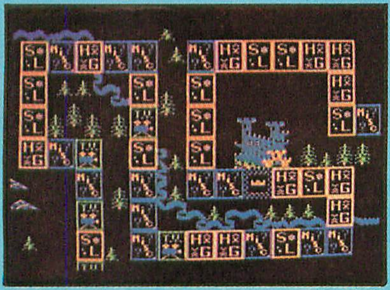
Here are just a few of many screens.



THE CHALLENGE.
Over 2000 stimulating trivia/fact questions will send you rummaging through your personal memory banks. Answer correctly and advance in your quest while adding more gold to your treasure. Fail and you lose ground.



THE ACTION.
You may have to face and battle a ferocious dragon. If you prevail, the dragon's cache of gold will be added to your treasure. If you fail, your journey will be slowed while you heal your wounds.



THE STRATEGY
Each questing party consists of three characters, a Knight, Prince and Page. Each has distinctly different physical characteristics, and all must complete the Quest. You must decide when to send them on to the next challenge.

48K Atari Disk

$39.95

Challenging excitement for 1 to 4 adventurers



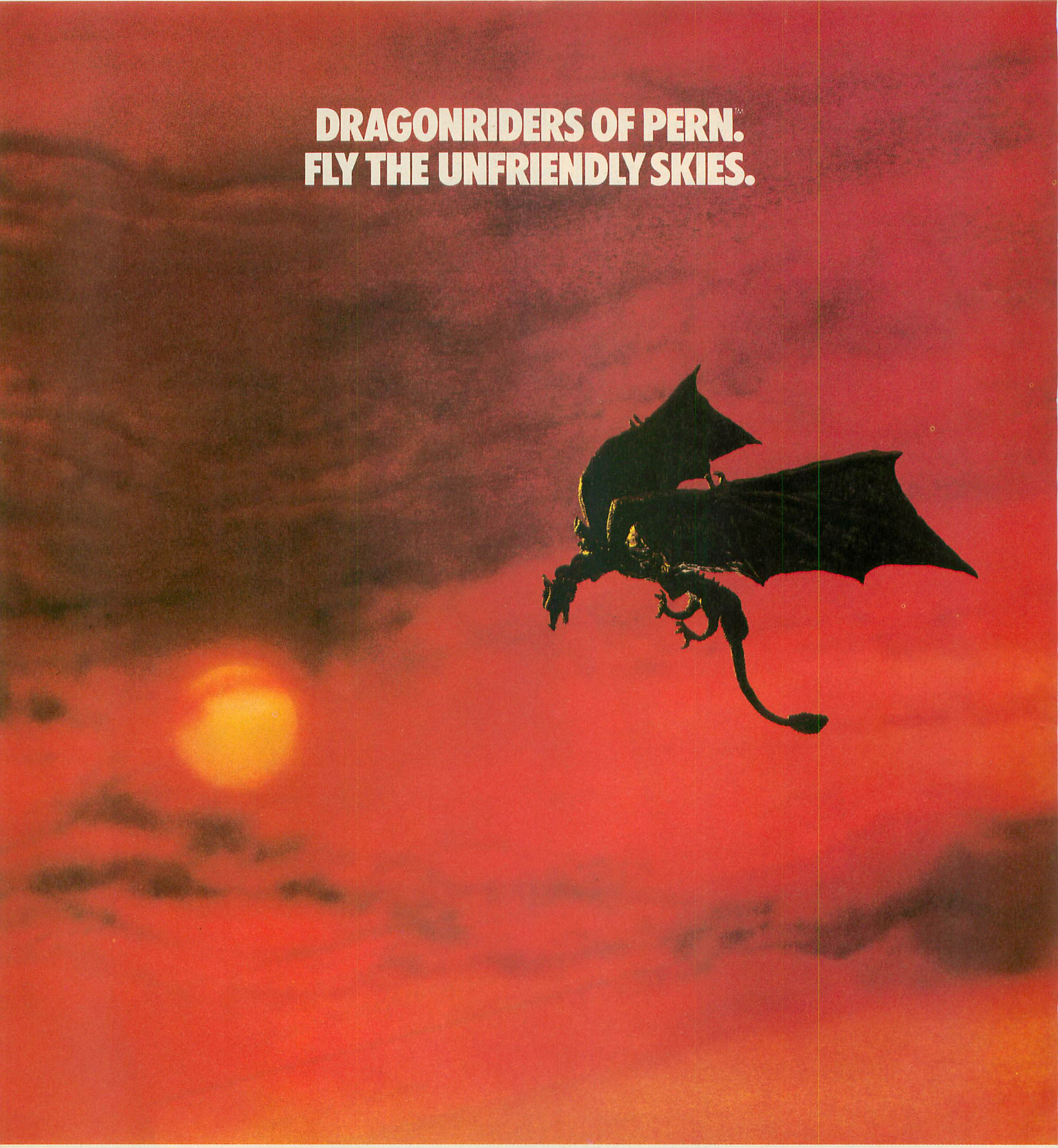
This exciting new concept in computer entertainment will keep you and your friends involved for hours and hours. This is probably the best party-game ever developed, and new question disks will be available.
Optional: Utility disk which allows you to create unlimited trivia questions and answers for educational or entertainment. The utility disk also includes over 1000 additional questions. **Utility disk $24.95.**

Royal Software

"Software fit for a king!"

2160 W. 11th • Eugene, OR 97402 • (503) 683-5361

Ask for Trivia Quest at your favorite Atari Computer Store or order directly from Royal Software. Use your MasterCard, Visa, American Express, or send check or Money Order including $2.90 shipping and handling.





Shooting down the menacing and constantly multiplying Threads isn't easy, but it's only one of the challenges in this official computer game version of Anne McCaffrey's famous book series.

Your strategy will be put to the test as you try to negotiate alliances with Pern's Lord Holders in an attempt to form the most powerful Weyr on the planet. Should you take a firm stance or compromise? Will asking a Craftmaster for assistance increase your chances for success? Maybe you should invite prospective allies to a Wedding or even a Dragon Hatching. Remember to check the Lord Holders personality traits first. It may be critical to your success.

Numerous screens combine to create truly unique and challenging game play. There's even a practice screen to sharpen your Thread Fighting skills.

If you liked the books, you'll love the game. After all, how often do you get the chance to actually fly a dragon?

One to four players, joystick and keyboard controlled.



EPYX™ COMPUTER SOFTWARE

Strategy Games for the Action-Game Player

DRAGONRIDERS OF PERN

Based on Anne McCaffrey's book of the same name, this game offers a negotiation/strategy section and a dragon flight/fight sequence. Look for good graphics, music, story and staying power.

$39.95. Epyx, 1043 Kiel Court, Sunnyvale, CA 94089. (408) 745-0700. 48K—disk.

KEN USTON'S PUZZLE PANIC

A new combination of puzzle solving and arcade action. Solve 11 puzzles in the correct order while being chased by monsters, and you get an even bigger challenge, the "Metasequence" braintwister.

$34.95. Epyx Inc., 1043 Kiel Court, Sunnyvale, CA 94089. (408) 745-0700. 32K—disk or cassette.

EASTERN FRONT 1941



This is the classic military simulation game based on the German invasion of Russia during World War II. You play the role of the German commander, viewing a map of Europe. Move the cursor to view and control blocks of troops.

Atari Corp., 1265 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000. 32K—disk. (1984 price not known at press time.)

MILLIONAIRE TYCOON

Enter the fast-paced worlds of the stock market and commodities exchanges—safely! Playing these investment simulations gives you the feel of what it's really like to be a big-time speculator. So hopefully you'll know how to buy winners if you enter the markets for real.

$39.95 each. HesWare, 150 North Hill Drive, Brisbane, CA 94005. (800 HES-WARE; in California (415) 468-4111. 48K—disk.

KEN USTON'S PROFESSIONAL BLACKJACK

Want to win the casino's money every time you sit down at a blackjack table? With about 20 hours of practice at this program you should be good enough at point counting to tilt the odds in your favor. The practice disk and manual are very clear and practical.

$69.95. Screenplay, Box 3558, Chapel Hill, NC 27514. (919) 493-8596. 48K—disk.

ROME AND THE BARBARIANS



More than a stock military strategy game, Rome requires you to concentrate on economics and other historically accurate issues that led to Rome's collapse. This captivating game includes excellent documentation and decent graphics.

$34.95. KRENtek Software, P.O. Box 3372, Kansas City, KS 66103. (913) 362-9267. 32K—disk or cassette.

LODE RUNNER

Here is the "popcorn" of computer games: 150 screens to fight through and totally addictive. As you work your way to the higher levels, you begin to notice the bricks and ladders assuming strange shapes, such as the Broderbund logo and various programmers' initials. Strategy and variety are key elements and the crowning touch is that you can design your own screens. A classic.

$34.95. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170. 48K—disk.

ONE ON ONE

New and innovative, One on One lets you assume the habits of basketball stars Julius Irving and Larry Bird. Let the computer put you on the court, and look for a longer review in this month's **Antic**.

$40. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. (415) 571-7171. 48K—disk.

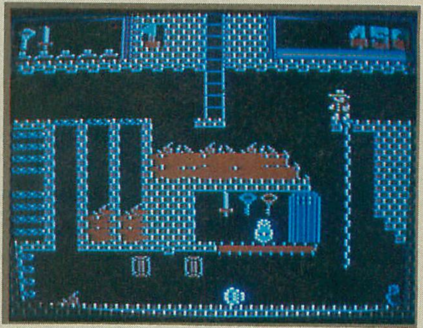
BOULDER DASH



Watch for falling rocks! Or—boulders, to be precise. Maneuver your character through underground mines in a quest for diamonds. An exciting game to challenge reflexes—terrific graphics.

$29.95. First Star Software, 22 E. 41 Street, New York, NY 10017. (212) 532-4666. 32K—disk. (or $39.95, 16K—cartridge.)

MONTEZUMA'S REVENGE



This is the best new game we've seen in months. Nothing startling different, but very well done. Montezuma's Revenge is another "caverns and ladders" game. You wander an underground labyrinth as Panama Joe, looking like a pudgy, lost tourist in the Mexican burial crypts. Along the way are snakes and spiders and bouncing skulls. Needless to say, you must avoid these things. There are also treasures and swords and laser beams. We're not sure how the laser beams got in there.

Approximately $30. Parker Brothers, 50 Dunham Rd., Beverly, MA 01915. (617) 927-7600. 48K—disk.

PIT STOP

An auto racing game, Pit Stop features driving reminiscent of Pole Position, and pit stop sequences requiring some strategy in loading gas and changing tires while the clock runs out. There are multiple skill levels and race courses.

$40. Epyx, 1043 Kiel Court, Sunnyvale, CA 94089. (408) 745-0700. 48K—cartridge.

continued on next page

Games continued



STAR RAIDERS

Zoom through a highly realistic 3–D starfield while you defend your starbases against the marauding Zylons. Action is fast and visuals are great on all four play-levels of this all-time classic game.

Atari Corp., 1265 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000. 16K—cartridge. (1984 price not known at press time.)

BRUCE LEE

Move Pharaohs' Curse to the Orient, add a few features, and you have Bruce Lee. Instead of shooting at the Pharaoh, you chop at the Green Yamo. The graphics are stylish Chinese red screens and oriental lanterns. If only the title screen didn't take so long!

$34.95. Datasoft, Inc., 19808 Nordhoff Place, Chatsworth, CA 91311. (800) 423-5916; in California (800) 701-5161. 48K—disk or cassette.

Flight Simulation

FLIGHT SIMULATOR II

Undoubtedly the most complex flight simulator program for the Atari. You must pilot a fully-equipped, single-engine Cherokee Archer over New York, Chicago, Los Angeles or Seattle. You control your plane with the joystick and about two dozen keys. The Flight Simulator II package contains two disks, several aeronautical charts, a double-sided "quick-reference" card, a 92-page text about aerodynamics, and a 90-page Pilot's handbook and flight manual. This simulator will probably best be enjoyed by pilots, student pilots and others familiar with aviation.

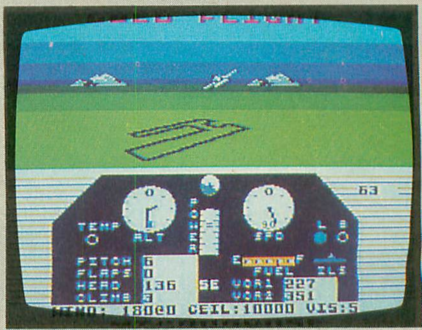
$49.95. SubLogic Corp., 713 Edgebrook Drive, Champagne, IL 61820. (217) 351-0837. 38K—disk.

SPACE SHUTTLE: A JOURNEY INTO SPACE

Climb into your space suit, switch on your flight computer, and enter the adventure that bridges the gap between fantasy and reality. Pilot the Space Shuttle. NASA uses this software in its astronaut training program. Your mission: Fly the shuttle from the launch pad to an orbit 210 miles above the earth, rendezvous with a satellite, re-enter the earth's atmosphere and land on a desert-based runway while battling a crosswind.

$34.95. Activision, Inc., 2350 Bayshore Frontage Road, Mountain View, CA 94043. (415) 960-0410. 16K—cartridge.

SOLO FLIGHT



Solo Flight, a real-time flight simulator game. Take off in clear skies and navigate through stormy weather as you race against the clock to deliver the mail. Your plane features retractable landing gear, realistic flight instruments, and can groundloop, slip, stall and crash!

$34.95. MicroProse Software, 10616 Beaver Dam Road, Hunt Valley, MD 21030. (301) 667-1151. 48K—disk or cassette.

Game Construction

ARCADE MACHINE

One of the first and most comprehensive design-it-yourself programs, Arcade Machine lets you create your own arcade game. You can animate anything from monsters to missiles, design their flight paths and choose the sounds they make when they blow up. The background creator alone is a nice graphics utility. A solidly programmed package.

$59.95. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170. 48K—disk.

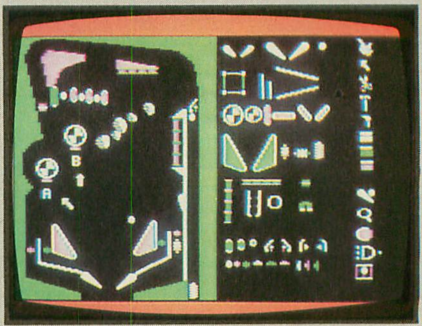
ADVENTURE CREATOR



Build a graphics maze adventure game, then play the game yourself. Design a dungeon complete with trapdoors, shifting walls and creatures to guard treasures.

$39.95. Spinnaker Software, 1 Kendall Square, Cambridge, MA 02139. 16K—cartridge.

PINBALL CONSTRUCTION SET



Programmer Bill Budge's software classic fosters creative thinking as you move icons around to design the pinball machine of your dreams—and then play on it.

$40. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. (415) 571-7171. 48K—disk.

Education

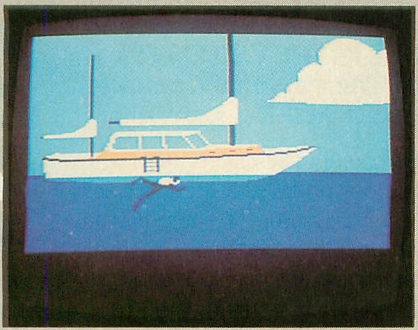
STICKYBEAR NUMBERS



Amusing pictures of geese, penguins, trains and more teach children the basics of counting. The program comes with a book, poster and stickers. Bright, bold pictures.

$39.95. Xerox/Weekly Reader, 245 Long Hill Road, Middletown, CT 06457. (203) 347-7251. Ages 3 to 6. 48K—disk.

SPELLDIVER



In this spelling game, your deep sea diver must remove moss from letters and guess the hidden word. The program includes an editor so you can add your own words, which is a useful feature.

$29.95. Scholastic, 730 Broadway, New York, NY 10003. (212) 505-3000. Ages 7 and up. 48K—disk.

THE POND

A charming program that teaches logic to young children as they decide which series of jumps will move a frog across a series of lily pads to the final "magic" lily. Nice visuals.

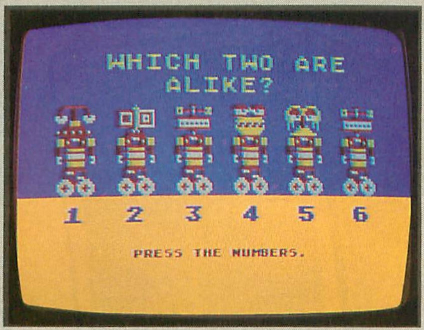
$39. Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570. (800) 431-1934. Ages 7 to adult. 32K—disk.

TROLL'S TALE & DRAGON'S KEEP

Two similar but equally enjoyable graphic/text adventure games for children aged 7 and up. In Troll's Tale you must find 16 stolen treasures; in Dragon's Keep you free 16 animals. In both you must avoid the troll and dragon. By deciding which routes to follow, you deduce where the hidden animals and objects are.

$29.95 each. Sierra-on-Line, P.O. Box 485, Coarsegold, CA 93614. (209) 683-6858. 48K—disk.

TONK IN THE LAND OF BUDDY-BOTS



Young children must match delightfully colorful robots, decide which one is different and make their own from the Minibot factory. Several unnamed members of the **Antic** staff enjoy this one a lot!

$39.95. Mindscape Software, 3444 Dundee Road, Northbrook, IL 60062. (312) 480-7667. Ages 4 to 8. 48K—disk.

Music

MUSIC CONSTRUCTION SET

A very creative tool for someone learning an instrument. Use an on-screen pointing finger to choose notes, set tempo and move sections of music around. Sample music files demonstrate what can be done.

$40. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. (415) 571-7171. 48K—disk.

BANK STREET MUSIC WRITER

This new program lets the user explore and compose music. Four voices can be programmed to play at once and simple editing modes let the user save and print the music.

$49.95. Mindscape, 3444 Dundee Road, Northbrook, IL 60062. (312) 480-7667. 48K—disk.

Books

MAPPING THE ATARI

By Ian Chadwick

YOUR ATARI COMPUTER

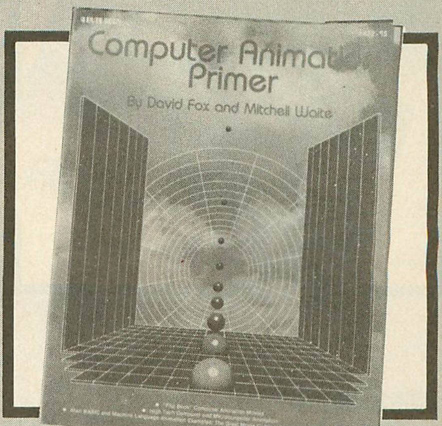
By Lon Poole

Don't expect to be called a programmer until your desktop has well-worn copies of these priceless guides. *Your Atari Computer* is packed with useful information about all aspects of the Atari and is easy to read.

Mapping The Atari is a comprehensive guide to the memory locations of the 400 and 800 computers. The purpose and significance of each location is described in detail. Program listings are often included to show you how to use these locations. The book is indexed by subject and by the location label.

Mapping the Atari, 14.95. 194 pages. Compute! Books, P.O. Box 5406, Greensboro, NC 27403. (800) 334-0868; in NC, call (919) 275-9809.

Your Atari Computer, $17.95. 458 pages. Osborne McGraw-Hill, 630 Bancroft Way, Berkeley, CA 94710. (415) 548-2805.



LINDA TAPSCOTT

COMPUTER ANIMATION PRIMER

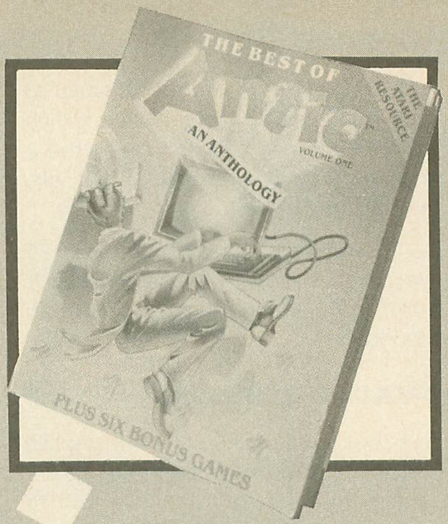
By David Fox and Mitchell Waite

If you're looking for a comprehensive guide to computer animation, get the *Computer Animation Primer.* The text covers all phases of computer animation, from PLOT statements to vertical and horizontal scrolling. It also contains an outstanding chapter on Player/Missile Graphics. If you enjoy computer graphics and animation, you need this book. Disk is available too.

$22.95. 501 pages. McGraw-Hill, 1221 Avenue of the Americas, New York, NY 10020. (212) 997-1221.

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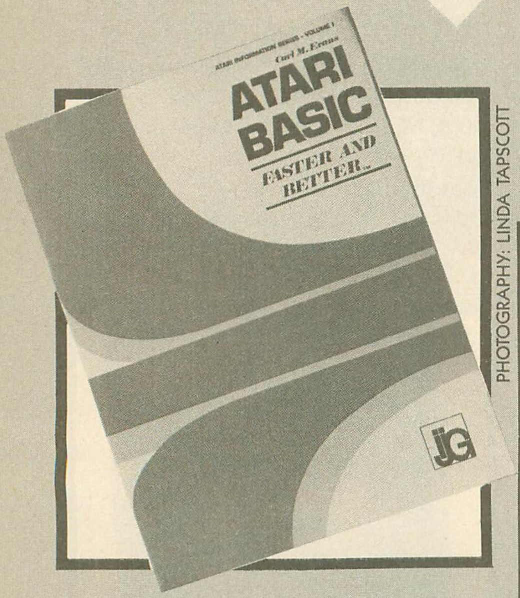
Books
continued



ATARI ROOTS: A Guide To Atari Assembly Language
By Mark Andrews

Simply the best-written and easiest-to-understand book for getting started in programming the fast and powerful machine language. Check out **Antic**'s second excerpt from the book right here in this issue.

$14.95. 288 pages. Datamost, 19808 Nordhoff Street, Chatsworth, CA 91311. (818) 423-5916; in California (808) 701-5161.

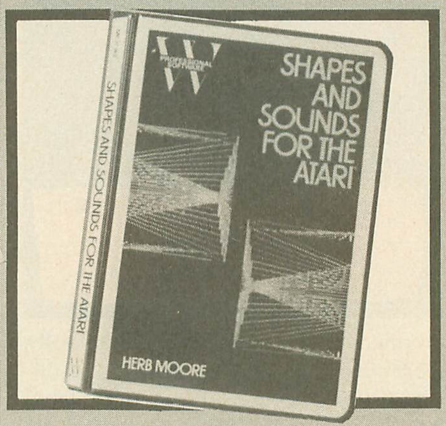


THE BEST OF ANTIC, VOL. I

Here's a collection of the most sought-after articles and programs from the first six issues of **Antic**. Subjects range from education to music to system guides, PLUS bonus games.

$12.95. 248 pages. Antic Publishing, Inc., 524 Second Street, San Francisco, CA 94107. (415) 957-0886.

PHOTOGRAPHY: LINDA TAPSCOTT



ATARI BASIC — Faster And Better
By Carl Evans

This text will show you how to improve your BASIC programs with machine-language subroutines. The book contains listings and descriptions of more than 80 subroutines, including routines which can make your program unlistable, analyze your program's variables, generate AUTORUN.SYS files and create scrolling screen displays. You don't need to know any machine language to use this book; Evans translated each assembly listing into DATA statements to use in your BASIC programs.

$15.95. 300 pages. IJG, Inc. Order from Antic Publishing, Inc., 524 Second Street, San Francisco, CA 94107. (415) 957–0886.

SHAPES AND SOUNDS FOR THE ATARI
By Herb Moore

This package, containing a book and two program disks, is for people who want to experiment with the Atari's sound and graphics capabilities. Some knowledge of BASIC is helpful, but not essential; the book is written for beginners. You will learn how to combine designs and sound effects, such as falling boxes and blinking diamonds, bird calls, sirens and explosions. Any of these effects may be included in your BASIC programs.

$45. 122 pages. Wiley & Sons, Inc., 605 Third Avenue, New York, NY 10158. (212) 850-6500. 32K—disk.

While the following books are not devoted to Atari programs and how-to information, anybody interested in Atari microcomputers would probably enjoy them a lot.

ZAP: The Rise And Fall Of Atari
By Scott Cohen

Short but detailed chronicle of how Nolan Bushnell invented Pong, founded Atari and sold the company to Warner Communications—who managed to run the videogame cartridge boom into the ground in just two years. It's packed with human interest and humor, although the author obviously knows nothing about computers and could care less. He has no comprehension of why Atari should be credited for the unique things it did right in the computer business: superb engineering, toll-free hotline, excellent service network and detailed professional documentation.

$14.95. 177 pages. McGraw–Hill Book Co., 1221 Avenue of the Americas, New York, NY 10020. (212) 997-1221.

FIRE IN THE VALLEY: The Making Of The Personal Computer
By Paul Freiberger And Michael Swaine

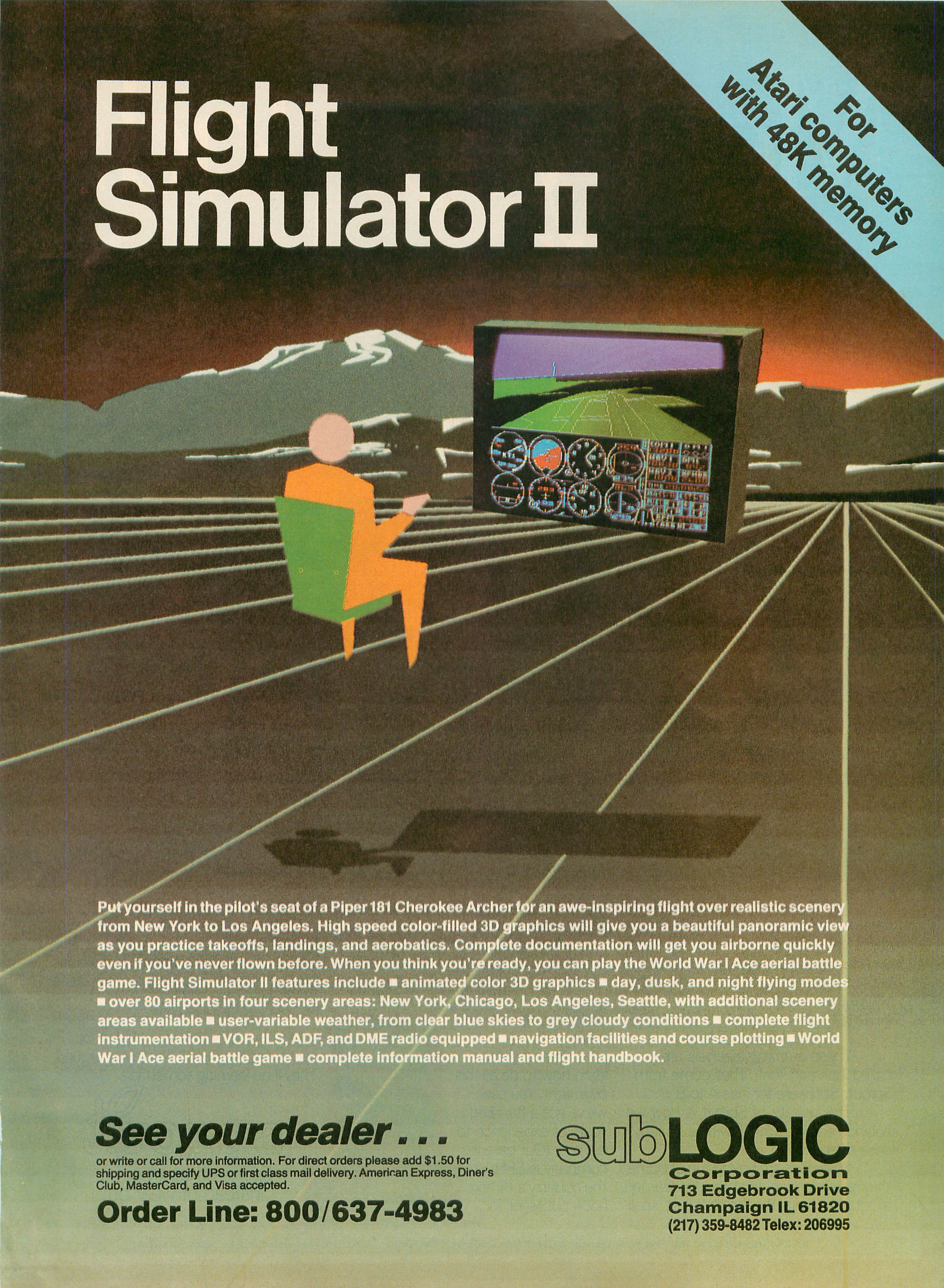
Deservedly a best-seller, this jaunty, exciting book brings alive the amazing triumph of a ragtag mob of computer hobbyists who made an end-run around the mainframe manufacturing establishment and created the microcomputer in a series of garage start-up companies.

$9.95. 288 pages. Osborne/McGraw–Hill, 2600 Tenth Street, Berkeley, CA 94710. (415) 548-2805.

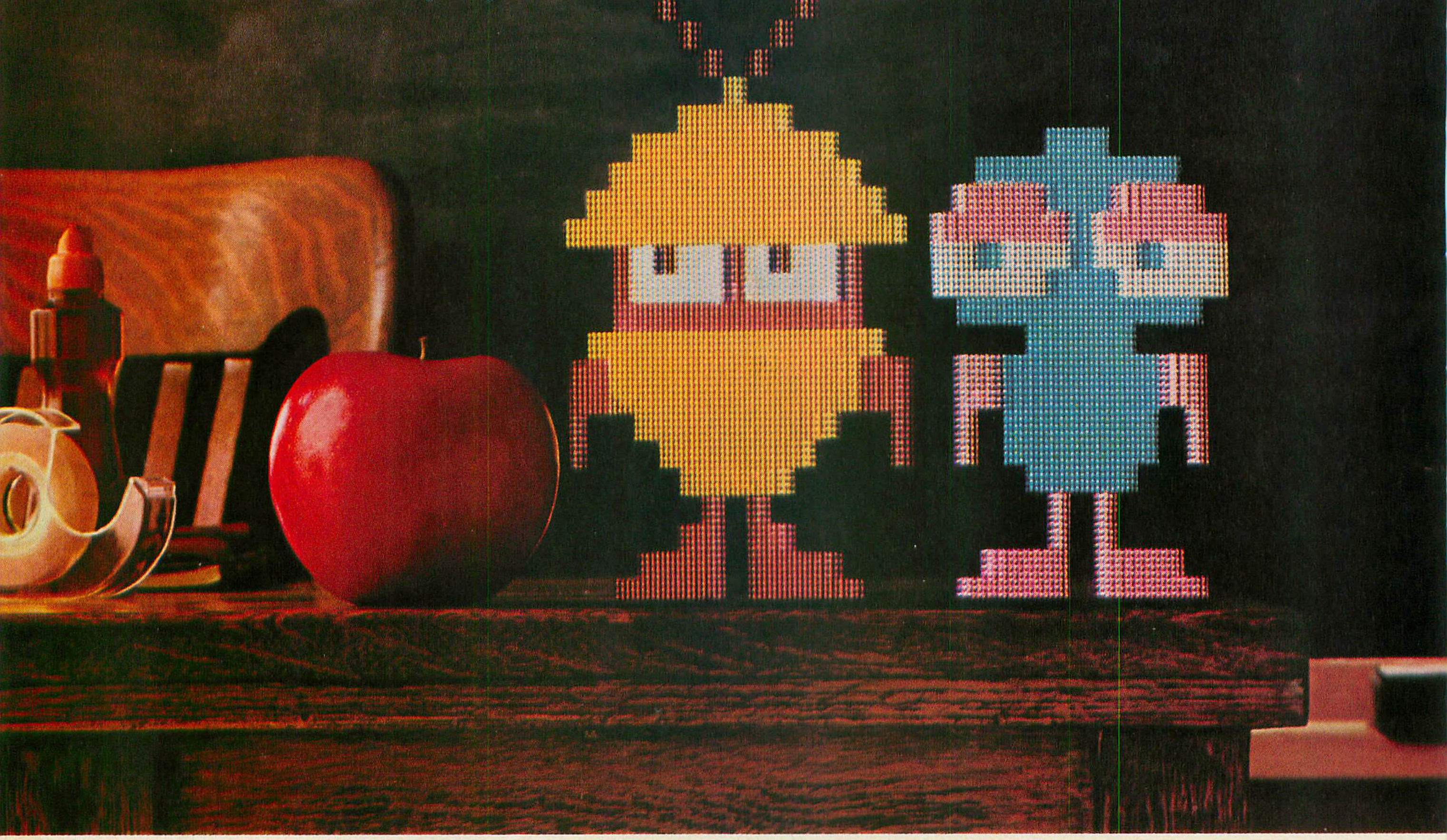
HOW TO GET FREE SOFTWARE
By Albert Glossbrenner

The sections on free (and low-cost) Atari software contain more solid information than the entire book "Free Software For Your Atari." The book's thorough roundup of program sources—low-price mail order companies, users groups, bulletin boards and telecommunications services—becomes in effect a history of the entire public domain software movement. Incidentally, **Antic** is the only budget commercial supplier of PD software the author lists for the Atari.

$14.95. 436 pages. St. Martin's Press, 175 Fifth Avenue, New York, NY 10010. (212) 674-5151.


Flight Simulator II
For Atari computers with 48K memory
Put yourself in the pilot's seat of a Piper 181 Cherokee Archer for an awe-inspiring flight over realistic scenery from New York to Los Angeles. High speed color-filled 3D graphics will give you a beautiful panoramic view as you practice takeoffs, landings, and aerobatics. Complete documentation will get you airborne quickly even if you've never flown before. When you think you're ready, you can play the World War I Ace aerial battle game. Flight Simulator II features include ■ animated color 3D graphics ■ day, dusk, and night flying modes ■ over 80 airports in four scenery areas: New York, Chicago, Los Angeles, Seattle, with additional scenery areas available ■ user-variable weather, from clear blue skies to grey cloudy conditions ■ complete flight instrumentation ■ VOR, ILS, ADF, and DME radio equipped ■ navigation facilities and course plotting ■ World War I Ace aerial battle game ■ complete information manual and flight handbook.
See your dealer . . .
or write or call for more information. For direct orders please add $1.50 for shipping and specify UPS or first class mail delivery. American Express, Diner's Club, MasterCard, and Visa accepted.
Order Line: 800/637-4983
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713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

Meet your kid's new teachers.



At first glance, they look like funny creatures right out of a computer game shoot 'em up. But underneath the funny surface, they represent one of the most serious approaches to home education you've ever heard of.

INTRODUCING SPROUT™ SOFTWARE. GAMES THAT TEACH.

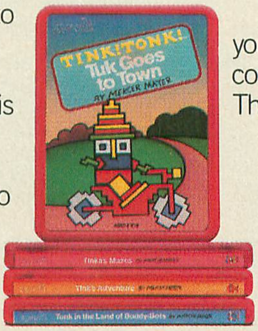
These amazing teachers are called Tink and Tonk. They come from Sprout. Software for kids 4 to 8.

The beauty of Sprout is how we balance entertainment with a healthy dose of education.

While kids are having fun at home, they're reinforcing what they've learned at school. Things like the alphabet, spelling, vocabulary, counting, adding, and pattern recognition.

You'll also like how Sprout prevents boredom. Our games grow up, instead of wear out. As kids get older, the game gets harder—with many variations and many decisions to make.

Sprout didn't learn how to do all this overnight. You see, we've got a hundred years of experience to lean on. (Our parent company is SFN, the country's #1 textbook publisher for elementary and high schools.)



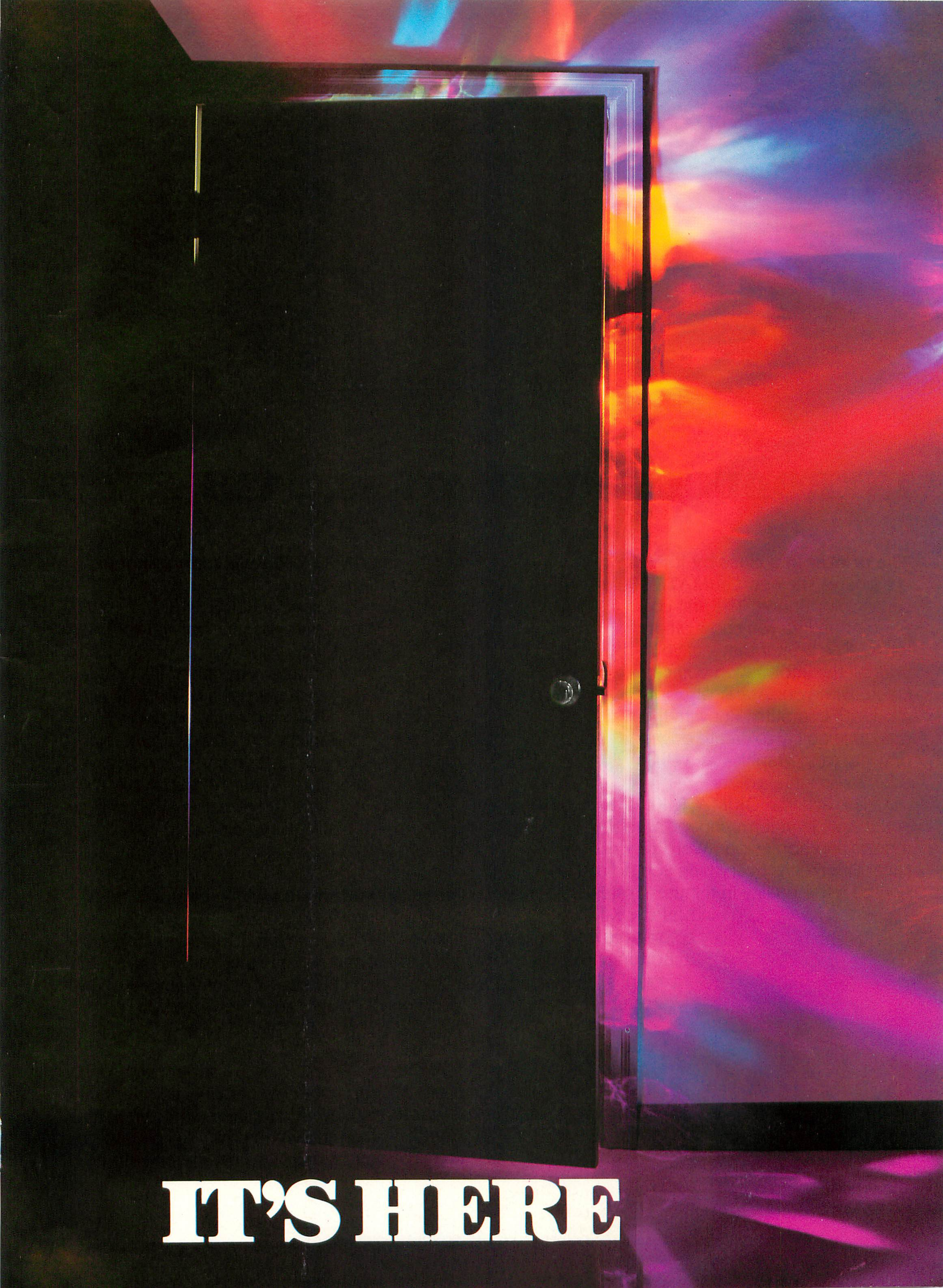
Compatible with Atari,® Commodore,® Apple,® and IBM.®

We've also got the experience of Mercer Mayer, who has written or illustrated 80 children's books. He dazzles kids with ideas and pictures that keep them coming back for more.

So let TINK!TONK!™ software teach your kids. And when they play at the computer, they won't be playing around. They'll be learning something.

sprout

Games that grow up. Instead of wear out.


IT'S HERE

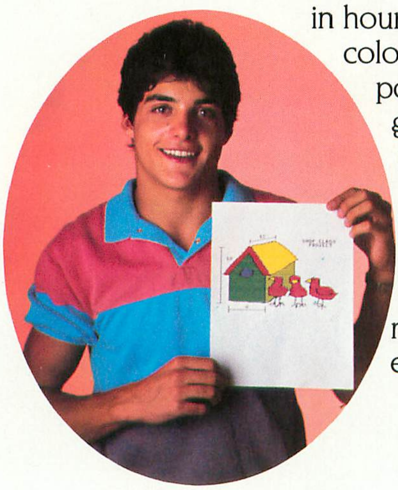
COL

INTRODUCING OKIMATE 10... THE FIRST

The printer in a class by itself.

It's here! The new OKIMATE 10 Personal Color Printer. The first color printer that lets you show off and tell all. The printer that lets you print all the information you can create with your Atari* or Commodore* computer. But with the remarkable ability to create original drawings and graphics as well, in over 26 beautiful colors.

A class act! The OKIMATE 10 gives you crisp, clean term papers, school reports and homework. Word processing capability means everything you do can be printed letter quality in minutes, instead of typed in hours. OKIMATE 10 color gives you the opportunity to print graphs, charts and pictures from popular graphics and drawing programs. OKIMATE 10's brilliant color means you'll shine, every time.





OKIMATE 10 feels right at home. Anywhere.

A special PLUG 'N PRINT™ package lets you plug your new OKIMATE 10 into your Atari or Commodore computer. And print. It's that easy. In minutes you'll be printing everything from soufflé recipes to needlepoint patterns. Party invitations to kitchen inventory. Love letters to gardening directions. At 240 remarkable words per minute. And not just in black and white, but in over 26 brilliant colors!

Financial statements will keep you tickled pink for very little green.

If you use your personal computer to keep track of mortgage payments, tuition payments, balance your checkbook or jump ahead of the Dow Jones', there's good news for you. You'll find that the new OKIMATE 10 gets down to business quickly. And easily.

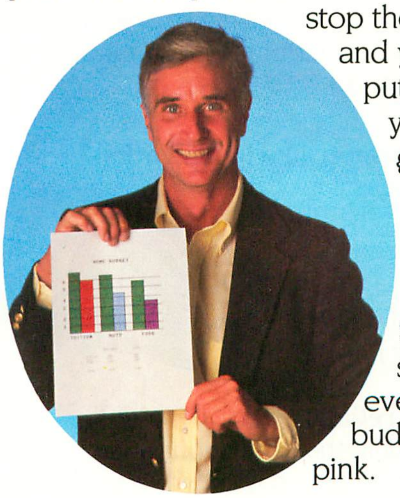
A "Learn-to-Print" diskette and tape shows you how to set up your new personal color printer and start printing. A complete OKIMATE 10 Handbook will show you how you can take your imagination to places it's never been before.

*Atari is a registered trademark of Atari Inc. *Commodore is a registered trademark of Commodore Business Machines, Inc.

OR

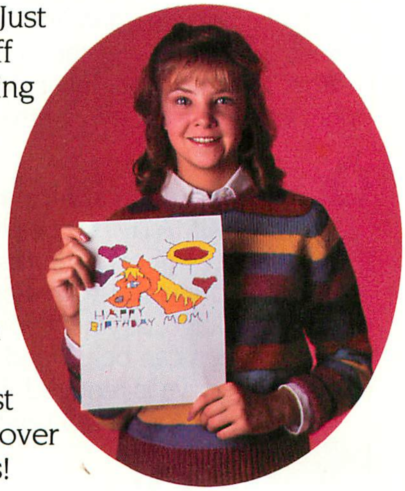
PERSONAL COLOR PRINTER UNDER $250.

And while your imagination is soaring, you'll be glad to know that your new printer can keep right up with it! The new OKIMATE 10 is built with the same tradition of quality and manufacturing excellence that has made Okidata the most respected name in computer printers. Okidata craftsmen specially designed and engineered the new OKIMATE 10 to be incredibly small and lightweight. And they made it quiet as a whisper. But their imagination didn't stop there. To help you and your personal computer keep within your personal budget, they made the OKIMATE 10 available at retailers everywhere for less than $250. Something that should make every personal budget tickled pink.



Color your world.

If you've been playing games on your personal computer, now you can get serious and still have fun. The new OKIMATE 10 is completely compatible with a variety of software packages that will run on your Atari and Commodore with a simple disk drive. Just load and you're off and running. Plotting charts. Designing special graphs. Creating original illustrations and pictures. Drawing special graphics. And printing them all beautifully for everyone. On most kinds of paper. In over 26 beautiful colors!





QUESTIONS & ANSWERS

Q: Why do I need a printer?

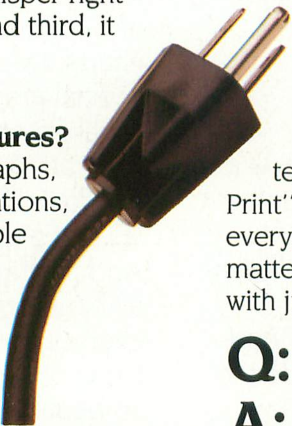
A: You might as well ask, "Why do I need crayons?" When it comes to communicating, "putting it on paper" is still the best way to get your message across. You can have lots of computer equipment, but without the OKIMATE 10, it doesn't mean very much. Unless you get your letter, report, term paper or party invitation off the screen and down on paper, nobody's going to see it.

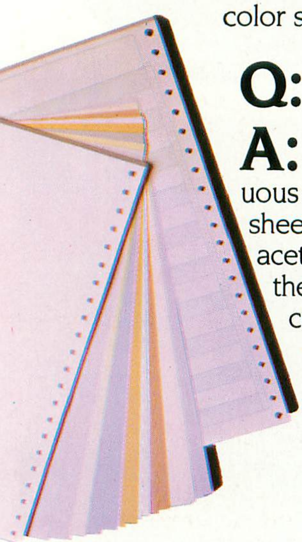
Q: What makes the OKIMATE 10 better than any other printer?

A: Because the OKIMATE 10 is unlike any other printer. First, it prints in COLOR. Up to 26 beautiful colors. Second, it prints up to 240 words a minute, so quietly you can talk in a whisper right next to it and still hear every word! And third, it prints letter quality, every time.

Q: What about graphics and pictures?

A: The OKIMATE 10 does it all. Graphs, charts, symbols, pictures, illustrations, and special drawings! With a compatible drawing package, anything you create on your screen can be printed in full color; a disk drive is required for color screen printing.





Q: What kind of paper can I use?

A: Just about any kind of smooth paper you want. From continuous feed computer paper to single sheets. From mailing labels to plastic acetate for overhead transparencies, the OKIMATE 10 prints crisp, clean, colorful images you'll be proud to send to friends, teachers, business associates, or frame and hang right in your own living room!



Q: Is the OKIMATE 10 easy to use?

A: As easy as "PLUG 'N PRINT!" No other printer is easier to use than the OKIMATE 10. Connecting the printer to your Commodore or Atari computer is, literally, a snap. The exclusive PLUG 'N PRINT package snaps into the printer. One cable connects it directly to your computer or disk/tape drive. Turn it on and you're in business. Once your OKIMATE 10 is up and running, the "Learn-to-Print" software program (included) teaches you printer basics—the "Color Screen Print" disk (also included) automatically prints everything on the screen in a single stroke. As a matter of fact, most of your printing can be done with just one command.

Q: What's the printer like in operation?

A: In one word: easy! Incredibly easy! The ribbon comes in a "Clean Hands" cartridge. So it's as easy to change as the tape in your audio cassette player.



Q: What about reliability?

A: Okidata has built the reputation of its complete line of printers on quality, dependability and rugged construction. The OKIMATE 10 is no exception. Don't let its light weight and compact size fool you. This printer is not a toy. It's a workhorse.

OKIDATA
an OKI AMERICA company

Available at retailers everywhere.

SOFTWARE LIBRARY

Antic type-in listing section includes every full-length program from this issue. Listings are easier to type and proofread, easy to remove and save in a binder if you wish.

COMING NEXT MONTH:
New, improved TYPO II corrects each listing line immediately after you type it!

Antic listings are printed out with the updated version of **Lister Plus** software. Non-Standard Magic, P.O. Box 45, Girard, Ohio 44420, $19.95 48K disk)

DISK SUBSCRIBERS: You can use all these programs immediately. Just RUN the correct filenames shown at the beginning of each accompanying article.

ERROR FILE

Following are the known program listing errors from the most recent issues of **Antic**. See the *Help* page in this issue for any additional last-minute corrections. If an error is not shown on these pages, all programs seen in **Antic** should RUN as published. The vast majority of problems that people have in getting a program to work properly are caused when they make common typing mistakes.

AMODEM

July '84

There is an error in the instructions of the R-Receive procedure (and others that mention filenames). Do not include quotes when typing in a filename during the run of the program.

SPACED-OUT NUMBERS

July '84

For non-XL machines, change line 31040 as follows: 31040 D=INT (VAL(C$)/INT(100²/\ (68–B(0)) +1.0E–03)).

RECALL

August '84

To get this program to run, you must first LIST it to disk or cassette. Type NEW and then type DIM QQ$(1). After this, ENTER the program. SAVE this version which will run from then on without the preliminaries.

CREEPY CAVERNS

August '84

In line 10, change M0(N,5) to M0(P,5). In line 349, there is a Y0 (Y-ZERO) that should be YO (with capital letter O). This first change will prevent an error 3 and the second an error 9.

October '84

Several division signs [/] were omitted due to typographical error in October programs. On the magazine pages, there is an empty space where the division sign should appear.

Here are the corrections to make our October programs run properly:

MOLE ATTACK

Page 53
Line 20: POKE 756,S/256
Page 54
Line 1060: T=18–L/2
Page 55
Lines 1090 & 1110: PEEK (20))/60)
Line 1140: 756,S/256
Line 1160: IF AB/2<>INT (AB/2)
Line 1170: AC=1 TO AB/2
Line 1330: 756,S/256

PLUS MINUS

Page 56
Line 469: SOUND 0,40,10,N/4
Line 9020: CHBASE/256
Page 57
Line 10014: ( )*, . / :

BOUNCING BALL

Page 57
Line 110: INT(X/256)

ANTIC 4/5 ANIMATOR/ EDITOR (5 listings)

Page 59
Line 84: A N T I C 4/5

Page 63 — In an unrelated error, the following two lines were left out of listing 3:

2820 FOR J=1 TO 10: FOR I=0 TO 8
2822 K=USR(COPY, 48,F(10+I),AW)

Page 66
"HYPNO.BAS" Line 210: ADDRESS/256)
"HYPNO.BAS"
Line 220: (BYTES/256)
"DEMO" Line 10: ERASE/PRINT

DIVER

Page 69
Line 550: #6;"/"
Line 630: 0)*20)/(SK+1
Line 650: *200)/(SK+1))
Line 670: *15)/(SK+1)

LISTING CONVENTIONS

Our listing printouts represent all ATASCII characters as they appear on the video screen. You generate some characters by a single keystroke, for example, the regular alphabet. Others require a combination or sequence of keystrokes. In this table, ESC means *press and release* the escape key before pressing another key. CTRL or SHIFT means *press and hold* the control or shift key while simultaneously pressing the following key.

The Atari logo key (Λ) "toggles" inverse video for all alphanumeric and punctuation characters. Press the logo key once to turn it on; press again to turn it off. In the XL line there is no logo key; inverse video is controlled by the Reverse Video Mode key. Decimal values are given as reference, and correspond to the CHR$ values often used in BASIC listings. Please note that the boxes around the special characters in the NORMAL VIDEO table are included only for visual reference. These boxes do not appear in the listed programs.

NORMAL VIDEO

FOR THIS	TYPE THIS	DECIMAL VALUE
	CTRL ,	0
	CTRL A	1
	CTRL B	2
	CTRL C	3
	CTRL D	4
	CTRL E	5
	CTRL F	6
	CTRL G	7
	CTRL H	8
	CTRL I	9
	CTRL J	10
	CTRL K	11
	CTRL L	12
	CTRL M	13
	CTRL N	14
	CTRL O	15
	CTRL P	16
	CTRL Q	17
	CTRL R	18
	CTRL S	19
	CTRL T	20
	CTRL U	21
	CTRL V	22
	CTRL W	23
	CTRL X	24
	CTRL Y	25
	CTRL Z	26
	ESC ESC	27
	ESC CTRL —	28
	ESC CTRL =	29
	ESC CTRL +	30
	ESC CTRL *	31
	CTRL .	96
	CTRL ;	123
	SHIFT =	124
	ESC SHIFT CLEAR	125
	ESC DELETE	126
	ESC TAB	127

INVERSE VIDEO

FOR THIS	TYPE THIS	DECIMAL VALUE
	Λ CTRL ,	128
	Λ CTRL A	129
	Λ CTRL B	130
	Λ CTRL C	131
	Λ CTRL D	132
	Λ CTRL E	133
	Λ CTRL F	134
	Λ CTRL G	135
	Λ CTRL H	136
	Λ CTRL I	137
	Λ CTRL J	138
	Λ CTRL K	139
	Λ CTRL L	140
	Λ CTRL M	141
	Λ CTRL N	142
	Λ CTRL O	143
	Λ CTRL P	144
	Λ CTRL Q	145
	Λ CTRL R	146
	Λ CTRL S	147
	Λ CTRL T	148
	Λ CTRL U	149
	Λ CTRL V	150
	Λ CTRL W	151
	Λ CTRL X	152
	Λ CTRL Y	153
	Λ CTRL Z	154
	ESC SHIFT DELETE	156
	ESC SHIFT INSERT	157
	ESC CTRL TAB	158
	ESC SHIFT TAB	159
	Λ CTRL .	224
	Λ CTRL ;	251
	Λ SHIFT =	252
	ESC CTRL 2	253
	ESC CTRL DELETE	254
	ESC CTRL INSERT	255

simplest database program ever!

INFOBITS

Article on page 17.

LISTING 1

```
5 REM INFO BITS
6 REM BY ANDY BARTON
7 REM ANTIC MAGAZINE
10 ? :? :? "  loading  INFO BITS"
15 GOSUB 2000
20 POKE 82,0
30 OPEN #2,12,0,"S:"
40 ? "K":DIM B$(130),R$(120),SEARCH$(1
20),RECORD$(120),S$(120)
50 ? :? :? "  INFO BITS"
60 TRAP 60:? :? "  1) ADD TO FILE   2)
SEARCH FOR ENTRY"
70 INPUT X
80 ON X GOTO 110,200
100 REM ^^^^^ ADD TO FILES
110 OPEN #3,9,0,"D1:INFOBITS.FIL"
120 ? :? "TYPE ENTRY:":INPUT B$
130 IF B$="" THEN CLOSE #3:GOTO 60
140 ? #3,B$:GOTO 120
200 REM ^^^^^ SEARCH
205 OPEN #1,4,0,"D1:INFOBITS.FIL"
210 ? :? "SEARCH FOR:":INPUT SEARCH$
220 IF SEARCH$="ALL" THEN 1000
230 POKE 752,1:X=USR(1536,ADR(SEARCH$)
,LEN(SEARCH$)):POKE 752,0
240 CLOSE #1:GOTO 60
1000 REM ^^^^^ PRINT ALL ENTRIES
1010 TRAP 240
1020 FOR X=1 TO 5000
1030 INPUT #1,B$:RECORD$=B$(11,LEN(B$)
)
1040 ? RECORD$:NEXT X
2000 FOR A=1536 TO 1723:READ B:POKE A,
B:NEXT A
2001 DATA 104,104,133,225,104,133,224,
104,104,133,226,162,16,169,5,157,66,3,
169,253,157,68,3,169,3
2002 DATA 157,69,3,169,131,157,72,3,16
9,0,157,73,3,32,86,228,48,42,162,0,160
,0,189,253,3
2003 DATA 209,224,240,11,192,0,240,12,
160,0,166,227,76,70,6,200,196,226,176,
16,232,236,88,3,176
2004 DATA 191,192,0,208,223,134,227,76
,47,6,96,162,32,169,9,157,66,3,169,131
,157,72,3,169,0
2005 DATA 157,73,3,165,84,201,20,176,1
6,169,7,157,68,3,169,4,157,69,3,32,86,
228,76,11,6
2006 DATA 169,176,157,68,3,169,6,157,6
9,3,32,86,228,173,252,2,201,255,240,24
9,169,255,141,252,2
2007 DATA 169,186,157,68,3,169,6,157,6
9,3,169,5,157,72,3,169,0,157,73,3,32,8
6,228,76,86
2008 DATA 6,160,193,206,217,160,203,19
7,217,160,155,125,155
2009 RETURN
```

TYPO TABLE

Variable checksum = 160170

Line num range	Code	Length
5 - 80	EL	337
100 - 1000	BR	385
1010 - 2005	SI	559
2006 - 2009	IZ	235

game of the month

BIFFDROP

Article on page 26.

LISTING 1

```
1 REM BIFFDROP
2 REM BY J.D. CASTEN
3 REM ANTIC MAGAZINE
5 C=C:L= NOT C:E=0.5:T=256:K=10:G=L+L:
COM V$(307),D$(T),S$(7):GRAPHICS 22:A=
PEEK(106)-8:POKE 106,A-L:GOTO 500
100 POKE 77,C:SOUND L,T-L,K,C:POKE 532
78,C:FOR J=C TO L STEP C:POKE 3,48+X*8
:POKE 203,26+Y*8:F=C:R=C
105 POKE 206,159-I*42+14*D:D=C:IF Y<G
OR Y>20 OR X=C OR X=19 THEN 800
110 LOCATE X,Y+E,V:IF D$(V,V)>"♥" THEN
 F=L
115 LOCATE X,Y-G,V:IF D$(V,V)>"⊢" THEN
 R=L
120 LOCATE X-E,Y,H:IF H<>32 THEN GOSUB
 230
125 IF PEEK(720) THEN 350
130 V=PEEK(632):IF V=7 THEN 200
135 IF V=11 THEN 215
140 IF V=14 THEN IF H=36 AND  NOT R TH
EN POKE 53761,134:Y=Y-E:I=L-I:POKE 537
61,C
145 IF  NOT F THEN IF  NOT U AND H<>36
 THEN Y=Y+E:NEXT J
150 IF U THEN U=U-L:POKE 53763,G*U+160
:IF U=5 THEN Y=Y-E
155 IF R+U+PEEK(644)=C AND F THEN U=6:
Y=Y-E:I=L-I:POKE 53763,175
160 NEXT J
200 X=X+E:LOCATE X,Y,V:LOCATE X,Y-L,D:
```

continued on next page

```
IF D$(V,V)>"ト" OR D$(D,D)>"ト" THEN X=X
-E
205 D=L:IF F THEN POKE 53761,138:I=L-I
:POKE 53761,C
210 GOTO 145
215 X=X-E:LOCATE X-E,Y,V:LOCATE X-E,Y-
L,D:IF D$(V,V)>"ト" OR D$(D,D)>"ト" THEN
 X=X+E
220 D=-L:IF F THEN POKE 53761,138:I=L-
I:POKE 53761,C
225 GOTO 145
230 IF H=36 THEN RETURN
231 IF H=40 THEN POP :GOTO 400
232 IF H=35 OR H=166 OR H=167 OR H>36
AND H<131 THEN RETURN
233 IF H=140 THEN GOSUB 300:GOTO 240
234 IF H=170 THEN POP :GOTO 350
235 Y=Y-E:RETURN
240 COLOR 32:PLOT X-E,Y:N=N-L:IF  NOT
N THEN RESTORE 10000+K*RO:READ H,V:PLO
T H,V:READ H,V:DRAWTO H,V
245 FOR V=G TO L STEP -E:FOR J=15 TO C
 STEP -V:SOUND G,J,K,J:NEXT J:NEXT V
250 IF N=C THEN FOR J=K*K TO 250 STEP
5:FOR V=G TO G+L:SOUND V,J-V,K,25-J/K:
NEXT V:NEXT J
255 POP :GOTO 305
300 RESTORE 5080:FOR J=L TO 6:READ V:S
$(J)=V$(V,V):V$(V,V)="♥":NEXT J:POKE 5
41,T-L:S$(7)=CHR$(PEEK(540)):RETURN
305 RESTORE 5080:FOR J=L TO 6:READ V:V
$(V,V)=S$(J):NEXT J:POKE 541,C:POKE 54
0,ASC(S$(7))+K:GOTO K*K
350 GOSUB 300:POKE 623,17:GOSUB 900:PO
KE 203,26+INT(Y+E)*8:FOR J=L TO 15 STE
P E:SOUND C,J*15,K,J:NEXT J:SL=SL-L
355 FOR J=15 TO C STEP -0.2:SOUND C,J*
15,J*15,J:POKE 706,16+J:NEXT J:POKE 70
6,28:POKE 623,18:IF SL THEN 370
360 FOR J=15 TO C STEP -E:FOR V=J TO C
 STEP -E:SOUND C,J+V,6,J:POKE 712,J+V:
NEXT V:NEXT J
365 ? #6;"↖":FOR J=19 TO 28:POKE DL+J,
6:NEXT J:POKE 756,224:GOTO 550
370 POSITION 15,K*G:? #6;SL-L;" ":REST
ORE 10009+RO*K:GOSUB 620:X=X1:Y=Y1:POK
E 540,K:POKE 541,C:GOTO K*K
400 ? #6;"↖":POKE 559,C:POKE DL+19,T/G
:POKE DL+K*G,23:POKE DL+21,7:COLOR 35:
PLOT C,13:DRAWTO C,K-G:POKE 54276,K+G
405 DRAWTO G+G,G+G:DRAWTO 15,G+G:DRAWT
O 19,K-G:DRAWTO 19,13:COLOR G+L:PLOT L
,13:DRAWTO 18,13:POSITION L,14
410 ? #6;"icked medley museum      TIM
E: ":POSITION G+G,16:? #6;"CONGRATULAT
IONS SLY!    press trigger":COLOR 131
415 POKE 206,131:PLOT K,K+G:PLOT K,K+L
:PLOT K+L,K:DRAWTO 13,7:DRAWTO 14,K+G:
COLOR 168:POKE DL+22,7:PLOT K+G,K+G
420 RESTORE 19999:GOSUB 620:GOSUB 900:
FOR J=15 TO C STEP -E:FOR V=C TO J STE
P E:SOUND L,V+J,8,J:POKE 712,V+T/G
425 NEXT V:NEXT J:POSITION K+G,15:POKE
 DL+23,22:POKE 203,122:SOUND C,250,K+G
,K:SOUND L,251,K+G,K:POKE 53768,L
430 ? #6;INT((PEEK(18)*T*T+PEEK(19)*T+
PEEK(K*G))/4195.365);" MINUTES":POKE 5
59,62:U=USR(ADR("hH┘P=I PW♦"))
435 GOTO 365
500 GRAPHICS 17:POKE 559,C:POKE 16,C:P
OKE 53774,C:J=A*T+24:I=3:GOSUB 9000:J=
A*T+360:I=G:GOSUB 9000:J=A*T+513:I=G
505 GOSUB 9000:POKE 207,A:POKE 54279,A
:POKE 53277,G+L:FOR J=704 TO 711:READ
H:POKE J,H:NEXT J:RESTORE 5055
510 V$="X%♥■♥P%┣■┣P%┘■ P■┘P% ''┤D┘Pi JP
X%♥┴i♥┐♥%┣┴i♥┐H% ┣┴i♥┐ ''_,I )♥ I♥♥HJPy''_
,J I I♥♥HJPy''_,K I I♥♥HJPy''_,L I I♥♥ I♥♥HJP"
515 V$(105)="v_&H1L↓♥♥h◤PW_&h1L↓♥♥h◤
PW_&/1L↓♥♥h◤PW_&K N↓♥♥f01N↓♥♥F0h◤Pn%
┤■I %h■J %/■K %K■L %┤┴i♥┐H%h┴i♥┐h%/┴"
520 V$(204)="i♥┐/■, P─)h■← %L┴i_ITP )♥
┐L═* P+)♦■↑ ■;═I▷■;═■<═■◢♥/═I┴ ▌/▼PU═/
P◥\P)┤¯_P¯.P■P ■◢P¯ .P◥\P¯ ''P)I┌P ■P ■"
525 V$(303)="←PLbG":POKE 205,A+G:FOR J
=L TO 15:READ X,Y:V$(X,X)=CHR$(A+Y):NE
XT J:D$="h)\''♥■♥L\G":H=INT(ADR(V$)/T)
530 V=ADR(V$)-H*T:D$(K/G,K/G)=CHR$(H):
D$(7,7)=CHR$(V):RESTORE 6000:POKE 206,
159:FOR J=1536 TO 1586:READ X
535 POKE J,X:NEXT J:POKE 513,6:POKE 54
286,192:U=USR(ADR(D$)):DL=PEEK(560)+T*
PEEK(561):POKE 204,C
550 POKE 87,G+L:POKE 559,C:FOR J=K-G T
O 17:POKE J+DL,K-G:NEXT J:POKE DL+J,7:
POKE DL+K*G,134:N=16:RESTORE 5090
555 COLOR G+L:FOR J=L TO N:READ X,Y,H,
V:PLOT X,Y:DRAWTO H,Y:DRAWTO H,V:DRAWT
O X,V:DRAWTO X,Y:NEXT J:POKE 87,L
560 POSITION L+G,K-G:? #6;"by ed caste
m":GOSUB 620:POSITION L+G,K:? #6;"pre
ss trigger":POKE 623,K*G:GOSUB 900
565 SOUND L,T-L,K,L:SOUND G,T-G,K,L:SO
UND G+L,7,K*G,C:POKE 53768,K:POKE 203,
150:POKE 512,38:COLOR K/G:POKE 712,C
570 PLOT C,K+L:DRAWTO C,14:DRAWTO G+L,
17:DRAWTO 6,17:PLOT 6,16:PLOT 13,16:PL
OT 13,17:DRAWTO 16,17:DRAWTO 19,14
575 DRAWTO 19,K+L:COLOR 131:PLOT 7,16:
DRAWTO K+G,16:X1=K:Y1=C:SL=K/G:RO=C:PO
KE 203,136:POKE 559,62:COLOR 32
580 U=USR(ADR("h◤┘P= T■ P=I P9♦")):PL
OT 7,16:DRAWTO K+G,16:GOSUB 900:FOR J=
138 TO 240 STEP G*G:POKE 203,J
585 FOR X=L TO K*G:NEXT X:NEXT J:POKE
G+L,C:POKE 559,C:FOR J=K-G TO K*G:POKE
 J+DL,6:NEXT J:POKE DL+K+G,6
590 POKE DL+25,T/G:POKE DL+26,C:POKE D
L+27,7:POKE DL+28,7:POKE 512,C:POKE 75
6,A:? #6;"↖":POKE 18,C:POKE 19,C
600 POKE 559,C:GOSUB 300:COLOR K/G:PLO
T C,C:DRAWTO C,19:DRAWTO 19,19:DRAWTO
19,C:DRAWTO L,C:RESTORE 10000+RO*K
605 COLOR 137:READ X,Y,H,V:PLOT X,Y:DR
AWTO H,V:READ N:COLOR 5:FOR J=L TO N:R
EAD X,Y,H,V:PLOT X,Y:DRAWTO H,V
607 NEXT J:POKE 623,18:READ N:IF N THE
N COLOR 36:GOSUB 700
610 READ N:IF N THEN COLOR 167:GOSUB 7
05
611 READ N:IF N THEN COLOR 166:GOSUB 7
00
612 READ N:IF N THEN COLOR 170:GOSUB 7
05
613 READ N:IF N THEN COLOR 168:PLOT 6,
18:COLOR 40:PLOT G,18:COLOR 136:PLOT K
,18
614 READ N:IF N THEN COLOR 35:GOSUB 71
0
615 READ N:IF N THEN COLOR 43:GOSUB 71
0
616 READ N:COLOR 140:FOR J=L TO N:READ
 X,Y:PLOT X,Y:NEXT J:IF  NOT RO THEN C
OLOR 32:PLOT 7,C:DRAWTO K+G,C
618 GOSUB 620:X=X1:Y=Y1:U=C:D=C:I=C:D$
```

```
="◘":D$(T-L)="◘":D$(G)=D$:RESTORE 5075
:FOR J=L TO K/G:GOTO 675
620 FOR J=C TO 6:READ X:POKE J,X:NEXT
J:READ S$,H,V:RESTORE 5080:FOR J=L TO
6:READ X:V$(X,X)=S$(J,J):NEXT J
625 POKE 53256,H:POKE 53257,V:RETURN
675 READ V:D$(V,V)="♥":NEXT J:D$(16,16
)="♥":D$(T/G,T/G)="♥":POSITION G+G,K*G
:D$(17,T/G)=D$(16,T/G):D$(36,36)="├"
680 D$(43,43)="◘":? #6;"SLYVESTERS:";S
L-L:POSITION 7,21:? #6;"room ";CHR$(RO
+17);:POKE 559,62:POKE 541,C:GOTO K*K
700 FOR J=L TO N:READ X,Y,V:PLOT X,Y:D
RAWTO X,V:NEXT J:RETURN
705 FOR J=L TO N:READ X,H,Y:PLOT X,Y:D
RAWTO H,Y:NEXT J:RETURN
710 FOR J=L TO N:READ X,Y,H,V:FOR R=X
TO H:PLOT R,Y:DRAWTO R,V:NEXT R:NEXT J
:RETURN
800 IF Y<G THEN Y=Y+E:NEXT J
805 SL=SL+L:RO=RO+L:IF X=19 THEN X=L
810 IF X=C THEN X=18
815 IF Y>19 THEN Y=G
820 X1=X:Y1=Y:? #6;"↖":GOTO 600
900 FOR J=53761 TO 53767:POKE J,C:NEXT
 J:POKE 53760,K/G:RETURN
4000 DATA ◘◘◘◘◘◘◘◘◘◘◘◘◘◘◘◘◘◘8]◘◘◘]8]┴┴┴┴
┴┴┴┴♥♥♥♥♥♥♥♥♥<◀<BI◘;B<[◘◘fBBf◘◘''''''''''''w◘
4001 DATA ◘◘◘◘◘◘◘◘◘◘♥♥<◀◀◀◀<←♥♥♥♥♥♥8◢♥◢<◀
|"◘.◢♥♥♥◘F |♣|8T8x♥♥♥♥♥♥↑♣♥♣<◀h0S├♥♥♥♥
4002 DATA P◢♥◢<◀|"\t♣♥♥♥├Ce◢>↑*↑N◘♥♥♥♥
_♣♥♣<◀h0♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥
4003 DATA ♥_↑_←↑/●↑♥♥♥◢♥♥♥♥♦|<8888♥♥♥[♥
♥P8Px8♦[8♥♥♥♣♥♥096←↑"| ↑♥♥♥◢♥♥♥/><↑↑↑
4004 DATA ↑♥♥♥●♥♥"◘1x80h8♥♥♥♣♥♥♥♥♥♥♥♥♥♥♥
♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥
4005 DATA BBBBff<<┴┴♥♥♥♥♥♥♥♥♥♥CC◀◀<<♥♥♥♥
♥♥♥♥<<◀◀CC♥♥♥♥♥♥♥♥♥┴┴<<ffBBBB♥♥♥♥<<◀◀
4006 DATA CC♥♥♥♥♥♥♥♥♥♥CC◀◀<<♥♥♥♥♥♥♥♥♥♥♥♥♥♥
♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥♥
5050 DATA 110,238,28,134,216,196,56,14
5055 DATA 62,4,74,5,86,3,98,7,101,6,11
4,4,127,5,140,3,153,6,160,7,243,0,248,
0,251,0,256,0,261,0
5075 DATA 140,166,167,168,170
5080 DATA 36,43,50,191,198,205
5090 DATA 5,6,5,7,5,8,7,13,9,8,9,13,12
,6,12,13,11,8,13,8,13,6,13,6,16,6,16,1
3,15,8,17,8,17,6,17,6,21,6,21,7,19,8
5091 DATA 21,13,23,8,25,8,23,8,23,13,2
7,8,29,13,31,8,33,13,31,14,31,15,128,1
22,0,112,122,0,0,├♥KI♥HI,3,1
6000 DATA 72,152,72,141,10,212,169,82,
141,26,208,169,224,141,9,212,160,8,153
,255,207,136,208,250,169,90,141,23
6005 DATA 208,169,92,141,22,208,104,16
8,104,64,72,165,106,105,1,141,10,212,1
41,9,212,104,64
9000 FOR R=L TO I:READ D$:U=USR(ADR("h
h◘Lh◘Kh◘Nh◘M◘♥1K◘MHeePW♦"),ADR(D$),J):
J=J+64:NEXT R:RETURN
10000 DATA 8,19,11,19,17,6,1,6,3,13,1,
13,2,2,3,4,3,8,3,13,3,1,7,14,7,14,6,16
,4,15,6,16,5,3,8,7,8,14,11,18,11,3,13
10001 DATA 4,13,7,13,7,18,1,14,3,14,12
,15,12,18,14,15,17,15,17,16,17,16,1,17
,2,17,1,18,2,18,8,1,3,6,12,3,6,17,4
10002 DATA 10,1,10,11,13,11,18,6,13,18
,3,15,16,11,15,18,2,14,18,1,18,18,16,3
,3,1,2,5,9,18,17,17,18,2,4,6,7,1,2,13
10003 DATA 0,0,0,5,4,2,14,2,2,10,1,16,
15,18
10009 DATA 128,104,48,0,82,0,0,├♥├♥◘├,
0,0
10010 DATA 13,1,13,3,9,7,1,7,4,13,4,13
,9,4,3,4,10,8,4,10,4,5,9,13,9,1,13,14,
13,15,3,15,16,7,16,14,16,7,17,7,18,8
10011 DATA 6,4,8,11,4,8,1,4,5,3,7,8,1,
10,11,8,10,15,10,10,15,6,16,17,2,5,13,
12,8,11,19,2,9,10,15,14,14,14,3,5,5,8
10012 DATA 7,10,8,12,12,8,0,1,2,14,5,1
8,1,2,16,5,16,5,14,11,4,12,14,12,14,15
,1,18
10019 DATA 0,172,64,0,92,0,0,◘♥♥♥├◘,0,
3
10020 DATA 19,4,19,7,14,2,3,2,11,4,4,7
,4,12,4,15,4,4,5,4,8,15,5,15,14,6,8,13
,8,6,9,13,9,6,10,6,13,3,11,4,11,4,12
10021 DATA 4,14,2,14,3,14,6,14,17,14,2
,15,2,16,8,15,8,16,2,3,4,10,14,8,18,4,
1,1,11,8,12,13,1,1,16,10,12,18,10,6,1
10022 DATA 3,12,1,3,6,5,7,13,5,7,9,13,
13,11,13,13,13,13,13,9,18,18,11,18,18,
13,18,18,2,8,11,8,4,6,19,0,2,17,8,18
10023 DATA 8,16,15,16,17,2,16,8,16,8,1
6,18,16,18,5,18,3,3,13,7,13,17,13,18,1
8
10029 DATA 0,56,88,0,62,0,0,◘♥♥♥├|,1,0
10030 DATA 19,17,19,18,10,6,4,7,4,12,4
,14,4,7,5,7,16,14,5,14,16,12,7,13,7,5,
8,5,18,12,10,13,10,12,13,13,13,8,16
10031 DATA 11,16,2,18,4,16,4,1,4,4,2,7
,14,4,6,14,6,8,17,4,8,11,4,15,18,4,3,3
,16,15,18,16,4,12,5,6,12,8,9,12,11,12
10032 DATA 2,17,17,0,0,1,8,5,11,15,3,1
1,7,11,7,10,10,11,10,9,13,11,13,6,1,18
,13,6,13,9,13,12,15,9,18,9
10039 DATA 64,72,128,0,128,192,176,♥♥◘
◘◘♥,1,1
10040 DATA 15,18,18,15,10,1,3,4,3,4,4,
4,5,3,6,4,6,6,6,7,6,9,6,9,18,10,7,11,7
,10,10,11,10,10,13,11,13,13,7,13,16
10041 DATA 11,16,11,16,7,2,6,18,5,10,1
4,8,6,18,8,4,4,13,4,4,18,4,4,18,7,13,2
,16,17,19,12,12,16,5,4,1,2,11,8,9,11
10042 DATA 11,12,11,14,15,19,16,17,0,0
,5,2,9,2,11,3,7,4,16,5,15,5,16,6,7,7,1
8,8,10,8,11,6,3,9,4,13,3,16,3,16,3,17
10043 DATA 5,18,6,9,8,9,5,12,7,12,7,15
,7,16,6,1,2,18,2,3,5,10,9,10,12,10,16
10049 DATA 76,176,168,0,172,128,0,♥♥♥♥
▶I:,1,0
10050 DATA 19,8,19,10,4,3,4,18,4,1,8,1
6,8,3,11,18,11,1,15,16,15,8,2,1,7,17,5
,10,2,9,14,17,12,18,7,5,7,12,5,7,7,12
10051 DATA 14,12,12,14,0,0,6,3,6,8,8,1
1,8,13,16,8,3,6,15,8,11,15,13,16,15,0,
0,2,15,3,18,3,1,18,4,18,2,15,2,4,17
10059 DATA 0,0,0,0,56,176,240,I:▶├♥♥├,3
,3
10060 DATA 7,19,10,19,10,2,3,6,3,6,4,6
,4,6,5,13,5,13,6,13,11,4,7,4,10,1,11,4
,11,11,11,11,14,6,15,17,15,6,11,10,11
10061 DATA 1,15,4,15,5,2,7,9,6,6,8,11,
6,8,18,1,18,10,4,4,2,7,10,8,2,16,18,5
10062 DATA 4,18,18,7,18,18,10,18,18,13
,18,18,16,18,18,2,4,4,6,6,11,10,0,0,0,
10,1,3,14,5,15,7,16,9,12,11,17,11,1
10063 DATA 13,10,14,1,18,17,18
10069 DATA 0,112,192,0,144,64,0,I:♥♥♥◘▶
,1,1
10070 DATA 1,16,11,16,6,6,1,6,4,7,4,10
```

continued on next page

```
,4,4,17,4,18,8,17,8,18,12,4,12,18,2,4,
4,4,9,1,4,6,3,7,12,7,4,6,8,13,15,18,6
10071 DATA 9,18,12,15,13,3,6,13,9,12,1
3,15,18,1,2,4,3,3,2,1,1,3,1,1,4,1,1,3,
1,3,18,5,7,18,9,11,18,1,4,2,5,6,6,1,8
10072 DATA 2,13,9,5,11,13,4,8,8,12,9,1
,7,2,7,4,5,4,9,5,7,8,7,8,5,8,6,10,7,11
,7,2,10,2,13,4,10,8,10,3,13,7,13,9,10
10073 DATA 10,13,9,6,6,1,12,5,9,15,5,1
5,11,15,17,16,8,16,14,18,18
10079 DATA 160,176,0,0,0,64,176,♥♥K■]:♥
,1,1
19999 DATA 0,0,0,108,158,170,46,┘ K]♥♥♥
,0,0
```

TYPO TABLE

Variable checksum = 260177

Line num range		Code	Length
1	- 120	KS	501
125	- 215	IT	520
220	- 255	GQ	456
300	- 360	NP	514
365	- 410	AM	542
415	- 500	GO	585
505	- 525	IG	554
530	- 560	CN	506
565	- 580	PJ	500
585	- 611	JQ	516
612	- 675	GY	605
680	- 4000	BG	532
4001	- 5055	IA	545
5075	- 9000	HK	532
10000	- 10010	UP	503
10011	- 10022	ZV	540
10023	- 10040	EA	562
10041	- 10051	WG	538
10059	- 10071	OT	597
10072	- 19999	HQ	242

more words in less space

WORD STORAGE SPACE SAVER

Article on page 19.

LISTING 1

```
0 DIM NAME$(1000),N$(100),FIND$(57)
1 GOSUB 8999
5 ? :? "ENTER TOTAL NUMBER OF WORDS":?
 "AND/OR PHRASES":INPUT DD
9 REM STORE WORDS IN STRING
10 ? "↖TYPE IN ";DD;" WORDS OR PHRASES
:":? "MAXIMUM LENGTH OF EACH IS 100 --
"
11 ? "MAXIMUM TOTAL LENGTH IS 1000 CHA
RS"
12 FOR X=1 TO DD
13 INPUT N$
14 N$(1,1)=CHR$(128+ASC(N$)):REM CONVE
RT 1ST CHAR TO INVERSE
15 NAME$(LEN(NAME$)+1)=N$
20 NEXT X
24 REM STORE INVERSE CHAR AT END OF ST
RING
25 NAME$(LEN(NAME$)+1)=CHR$(128)
100 ? :? NAME$
101 REM SEARCH AND OUTPUT AN ITEM
102 ? :? "LOCATE WHICH WORD?(1-";DD;")
"
103 INPUT C
105 BEGIN=USR(ADR(FIND$),ADR(NAME$),C)
110 LENGTH=PEEK(1)
115 ? :? CHR$(ASC(NAME$(BEGIN,BEGIN))-
128);:BEGIN=BEGIN+1
116 IF LENGTH=1 THEN 102
120 ? NAME$(BEGIN,BEGIN+LENGTH-2)
999 GOTO 102
8998 REM STORE ML PROGRAM IN A STRING
8999 RESTORE 9000:FOR X=1 TO 57:READ A
:FIND$(X,X)=CHR$(A):NEXT X:RETURN
9000 DATA 104,104,133,1,104,133,0,104,
133,3,104,133,2,169,1,133,212,160,0,13
2,213,177,0,16,18
9005 DATA 198,2,208,14,165,3,208,8,200
,177,0,16,251,132,1,96,198,3,230,212,2
08,2,230
9010 DATA 213,230,0,208,224,230,1,208,
220
```

LISTING 2

```
0000            10        *=  $0600
0600 68         20        PLA          ;
 no. of bytes
0601 68         30        PLA          ;
 save start address
0602 8501       40        STA 1        ;
 of string that holds
0604 68         50        PLA          ;
 the list of items
0605 8500       60        STA 0
0607 68         70        PLA          ;
 get & store the
0608 8503       80        STA 3        ;
 item no. to search
```

```
060A 68          0090      PLA           ;
 in a counter
060B 8502        0100      STA 2
060D A901        0110      LDA #1
060F 85D4        0120      STA 212       ;
 set BEGIN=1
0611 A000        0130      LDY #0
0613 84D5        0140      STY 213
0615 B100        0150      LDA (0),Y     ;
 get a char from string
0617 1012        0160      BPL 1579      ;
 is it inverse?
0619 C602        0170      DEC 2         ;
 yes, decrement counter
061B D00E        0180      BNE 1579
061D A503        0190      LDA 3
061F D008        0200      BNE 1577      ;
 found item yet?
0621 C8          0210      INY           ;
 yes, now find length
0622 B100        0220      LDA (0),Y     ;
 of item and
0624 10FB        0230      BPL 1569
0626 8401        0240      STY 1         ;
 store in loc. 1
0628 60          0250      RTS           ;
 return to BASIC
0629 C603        0260      DEC 3         ;
 haven't found item yet, so
062B E6D4        0270      INC 212       ;
 BEGIN=BEGIN+1
062D D002        0280      BNE 1585
062F E6D5        0290      INC 213
0631 E600        0300      INC 0         ;
 point to next
0633 D0E0        0310      BNE 1557      ;
 char in string
0635 E601        0320      INC 1
0637 D0DC        0330      BNE 1557      ;
 branch!
```

the toolbox

WINDOWS II

Article on page 66.

LISTING 1

```
1 REM WINDOWS2
2 REM BY JERRY WHITE & DAVE CULBERTSON
3 REM ANTIC MAGAZINE
100 GRAPHICS 0:POKE 752,1:POKE 82,4
110 ? :? "   GRAPHICS WINDOWS OF TEXT"
120 ? :? "BY JERRY WHITE & DAVE CULBER
TSON"
130 DIM W$(116),MSG$(11),WORK$(11*16),
E$(263)
140 ? :? "CREATING W$"
150 FOR ME=1 TO 116:READ IT:W$(ME,ME)=
CHR$(IT):NEXT ME
160 ? :? "CREATING E$"
170 FOR ME=1 TO 263:READ IT:E$(ME,ME)=
CHR$(IT):NEXT ME
180 G=8:W=40:GRAPHICS G+16:GOSUB 260
190 G=7:W=40:GRAPHICS G+16:GOSUB 260
200 G=6:W=40:GRAPHICS G+16:GOSUB 260
210 G=5:W=20:GRAPHICS G+16:GOSUB 260
220 G=4:W=10:GRAPHICS G+16:GOSUB 260
230 G=3:W=10:GRAPHICS G+16:GOSUB 260
240 GRAPHICS 0:POKE 82,2:? :? "BASIC":
? "IS";:END
250 REM DISPLAY MSG SUBROUTINE
260 SETCOLOR 0,9,10:SETCOLOR 1,3,10:SE
TCOLOR 2,9,0:SETCOLOR 4,1,2
270 REM CLEAR STRINGS
280 WORK$=CHR$(0):WORK$(11*16)=CHR$(0)
:WORK$(2)=WORK$:MSG$=WORK$
290 FOR LINE=1 TO 3
300 REM CREATE MSG$ TO DISPLAY
310 MSG$="Gr#? TYPE ":MSG$(4,4)=CHR$(G
+48):MSG$(10,10)=CHR$(LINE+48):MSG$(11
,11)=CHR$(0)
320 REM CONVERT TO GRAPHICS FORMAT
330 ASM=USR(ADR(E$),ADR(WORK$),ADR(MSG
$),LEN(MSG$)-1,LINE)
340 REM WINDOW IT TO SCREEN RAM
350 ASM=USR(ADR(W$),ADR(WORK$),W*8*(LI
NE-1),8,20,W)
360 REM DELAY WITH SOUND AND FLASHING
370 SOUND 0,LINE*75,14,5:X=25*LINE:POK
E 20,0
380 A=PEEK(20):POKE 708,45:IF A<X THEN
 POKE 708,40:GOTO 380
390 POKE 708,40:SOUND 0,0,0,0:NEXT LIN
E:RETURN
400 REM DATA FOR W$
410 DATA 104,104,133,206,104,133,205,1
04
420 DATA 141,1,6,104,141,0,6,104
430 DATA 133,208,104,133,207,104,104,1
33
440 DATA 209,104,141,3,6,104,141,2
450 DATA 6,165,88,133,203,165,89,133
460 DATA 204,24,165,203,109,0,6,133
470 DATA 203,165,204,109,1,6,133,204
480 DATA 160,0,177,203,170,177,205,145
490 DATA 203,138,145,205,200,196,209,2
08
500 DATA 241,169,0,198,207,197,207,208
510 DATA 6,197,208,240,30,198,208,24
520 DATA 152,101,205,133,205,144,3,230
530 DATA 206,24,165,203,109,2,6,133
540 DATA 203,165,204,109,3,6,133,204
550 DATA 24,144,197,96
560 REM DATA FOR E$
570 DATA 104,104,133,204,104,133,203,1
04
580 DATA 133,212,104,133,211,104,104,1
33
590 DATA 216,10,133,217,104,104,41,3
600 DATA 24,106,106,106,41,192,133,207
```

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```
610 DATA 133,208,169,0,133,219,169,4
620 DATA 133,220,169,0,168,145,219,200
630 DATA 192,16,208,249,169,255,133,21
5
640 DATA 160,0,177,211,201,128,144,4
650 DATA 132,215,73,128,201,96,144,4
660 DATA 160,3,176,19,201,64,144,4
670 DATA 160,1,176,11,201,32,144,5
680 DATA 176,5,24,144,205,160,2,41
690 DATA 31,10,10,10,133,213,24,152
700 DATA 109,244,2,133,214,160,0,132
710 DATA 209,132,210,162,0,134,205,164
720 DATA 210,177,213,133,206,164,209,1
65
730 DATA 206,48,6,177,219,5,207,145
740 DATA 219,24,102,207,24,102,207,6
750 DATA 206,232,224,4,208,231,165,215
760 DATA 240,5,56,241,219,145,219,165
770 DATA 208,133,207,230,209,230,205,1
65
780 DATA 205,201,2,208,208,230,210,164
790 DATA 210,192,8,208,190,240,3,24
800 DATA 144,160,165,203,72,165,204,72
810 DATA 160,0,177,219,145,203,200,192
820 DATA 2,208,247,177,219,170,200,177
830 DATA 219,72,200,132,218,164,217,13
8
840 DATA 145,203,104,200,145,203,24,16
5
850 DATA 203,101,217,133,203,144,2,230
860 DATA 204,164,218,192,16,208,220,10
4
870 DATA 133,204,24,104,105,2,133,203
880 DATA 144,2,230,204,230,211,208,2
890 DATA 230,212,198,216,208,177,96
```

TYPO TABLE

Variable checksum = 198475

Line num range	Code	Length
1 - 180	QU	442
190 - 280	ON	525
290 - 380	XQ	508
390 - 500	SK	418
510 - 620	TL	379
630 - 740	RR	397
750 - 860	XD	421
870 - 890	JR	99

LISTING 2

```
0 ;WINDOWS2.ASM
01 ; ..TEST INTO GRAPHICS SCREENS..
02 ; BIT to BIT PAIR Expansion with
03 ; conversion for 4 color Graphics
04 ; with string input capability.
05 ;   vs.2     by Dave Culbertson
06 ;   (C) Jun 11,1984 CE Softwart
07 ;
08 ;EQUATES
09 DAT    =     $CB        ;ADR OF RESULT ST
RING.
10 SW     =     $CD        ;FLAG FOR 2 NIBBL
ES.
11 TMP    =     $CE        ;HOLDS WORKING BY
TE.
12 COL    =     $CF        ;COLOR MODIFIER R
EG.
13 COL1   =     $D0        ;COPY OF COLOR MO
DIFIER.
14 YINR   =     $D1        ;Y POINTER INNER
LOOP.
15 YOUT   =     $D2        ;Y POINTER OUTER
LOOP.
16 CHR    =     $D3        ;ADR OF SOURCE ST
RING.
17 PT     =     $D5        ;PTR INTO CS.
18 INV    =     $D7        ;INVERSE FLAG.
19 NUM    =     $D8        ;LEN OF STRING.
20 NUM1   =     $D9        ;COPY OF LEN*2.
21 TEA    =     $DA        ;TEMP AREA.
22 PTR    =     $DB        ;PTR TO WORK AREA
 ($400).
23 CS     =     756        ;PAGE PNTR OF CHA
R SET.
24 ;
25        *=    $4000      ;IGNORE (RELOCATA
BLE)
26         GET   THE       VARIABLES
27 ;
28        PLA
29        PLA
30        STA DAT+1
31        PLA
32        STA DAT
33        PLA
34        STA CHR+1
35        PLA
36        STA CHR
37        PLA
38        PLA
39        STA NUM          ;GET NUMBER OF CH
RS
40        ASL A
41        STA NUM1         ;NUM1=NUM*2
42        PLA
43        PLA
44        AND #3           ;ONLY BITS 1&2 OK
.
45        CLC
46        ROR A
47        ROR A
48        ROR A
49        AND #192         ;ONLY PASS BITS 7
&8
50        STA COL          ;STORE COLOR CODE
.
51        STA COL1         ;AND A COPY.
52        LDA #0           ;POINT TO PAGE 4.
53        STA PTR
54        LDA #4
55        STA PTR+1
56 ; CONVERT FROM CHARACTER TO
57 ; ADR OF PLACE IN CHARACTER SET
58 BE     LDA #0           ;CLEAR WORK AREA.
59        TAY
60 BF     STA (PTR),Y
61        INY
62        CPY #16
63        BNE BF
64        LDA #255
65        STA INV          ;NORMAL MODE.
66        LDY #0           ;Y=0
67        LDA (CHR),Y      ;GET THE CHARACTE
R
68        CMP #128         ;IS A <127?
69        BCC T            ;YES GOTO T
70        STY INV          ;SET INVERSE.
71        EOR #128
72 ;
73 T      CMP #96          ;IS IT LOWERCASE?
74        BCC U            ;NO,GOTO U.
75        LDY #3           ;SET OFFSET.
76        BCS Q            ;GOTO Q.
77 ;
78 U      CMP #64          ;IS IT UPPERCASE?
```

```
        BCC V          ;NO,GOTO V.
        LDY #1         ;SET PAGE 1.
        BCS Q          ;GOTO Q.
;
V       CMP #32        ;IS IT A SYMBOL?
        BCC W          ;NO,GOTO W.
        BCS Q          ;YES,GOTO Q.
; 1st ISLAND TO BEGINNING.
IS      CLC
        BCC BE         ;GOTO BEGINNING.
;
W       LDY #2         ;A GRAPHICS CHR!
;
Q       AND #31        ;NOW ACC <32!
        ASL A          ;MULTIPLY BY 8!
        ASL A
        ASL A
        STA PT         ;INDEX INTO PAGE.
        CLC            ;MOVE PAGE OFFSET
.
        TYA
        ADC CS         ;ADD C.S. TO OFFS
ET.
        STA PT+1       ;STORE IT.
; MAIN ROUTINE
        LDY #0
        STY YINR
        STY YOUT
S       LDX #0
        STX SW
        LDY YOUT
        LDA (PT),Y
        STA TMP
B       LDY YINR
        LDA TMP
        BMI C
;
        LDA (PTR),Y
        ORA COL
        STA (PTR),Y
C       CLC
        ROR COL
        CLC
        ROR COL
        ASL TMP
        INX
        CPX #4
        BNE B
;
        LDA INV        ;CHECK FOR INVERS
E?
        BEQ D
        SEC            ;INVERT BITS
        SBC (PTR),Y
        STA (PTR),Y
D       LDA COL1       ;ADJUST FOR NEXT
        STA COL
        INC YINR
        INC SW
        LDA SW
        CMP #2
        BNE B
;
        INC YOUT
        LDY YOUT
        CPY #8
        BNE S
        BEQ K          ;HOP OVER ISLAND.
; 2nd ISLAND TO BEGINNING
HOP     CLC
        BCC IS         ;GOTO BEGINNING.
; CONVERT DAT TO STRING FORMAT.
K       LDA DAT        ;PUSH DAT ON STAC
K
        PHA
        LDA DAT+1
        PHA
        LDY #0
AG      LDA (PTR),Y
        STA (DAT),Y
        INY
        CPY #2
        BNE AG
J       LDA (PTR),Y
        TAX
        INY
        LDA (PTR),Y
        PHA
        INY
        STY TEA
        LDY NUM1
        TXA
        STA (DAT),Y
        PLA
        INY
        STA (DAT),Y
        CLC
        LDA DAT
        ADC NUM1
        STA DAT
        BCC G
        INC DAT+1
G       LDY TEA
        CPY #16
        BNE J
        PLA            ;RECOVER & BUMP D
AT
        STA DAT+1
        CLC
        PLA
        ADC #2
        STA DAT
        BCC I
        INC DAT+1
I       INC CHR        ;INCREMENT CHR
        BNE H
        INC CHR+1
H       DEC NUM
        BNE HOP        ;DO NEXT CHARACTE
R.
        RTS
```

assembly language

ALL ABOUT I/O

Article on page 68.

LISTING 1

```
10 ;
20         .TITLE "PRNTSC ROUTINE"
30         .PAGE "ROUTINES FOR PRINTING ON THE SCREEN"
40 ;
50         *=  $5000
60 ;
70 BUFLEN =  25
80 ;
90 EOL    =   $9B      ;ATASCII CODE FOR END OF LINE CHARACTER
0100 ;
0110 OPEN =  $03      ;TOKEN FOR OPENING A DEVICE OR FILE
0120 OWRIT = $08      ;TOKEN FOR "OPEN FOR WRITE OPERATIONS"
0130 PUTCHR = $0B     ;TOKEN FOR "PUT CHARACTER"
0140 CLOSE = $0C      ;TOKEN FOR CLOSING A DEVICE OR FILE
0150 ;
0160 IOCB2 = $20      ;OFFSET FOR IOCB NO.2
0170 ICCOM = $0342    ;COMMAND BYTE (CONTROLS CIO OPERATIONS)
0180 ICBAL = $0344    ;BUFFER ADDRESS (LOW BYTE)
0190 ICBAH = $0345    ;BUFFER ADDRESS (HIGH BYTE)
0200 ICBLL = $0348    ;BUFFER LENGTH (LOW BYTE)
0210 ICBLH = $0349    ;BUFFER LENGTH (HIGH BYTE)
0220 ICAX1 = $034A    ;AUXILIARY BYTE NO.1
0230 ICAX2 = $034B    ;AUXILIARY BYTE NO.2
0240 ;
0250 CIOV =  $E456    ;CIO VECTOR
0260 ;
0270 DEVNAM .BYTE "E:",EOL
0280 ;
0290 OPNSCR
0300       LDX #IOCB2
0310       LDA #OPEN
0320       STA ICCOM,X
0330 ;
0340       LDA #DEVNAM&255
0350       STA ICBAL,X
0360       LDA #DEVNAM/256
0370       STA ICBAH,X
0380       ;
0390       LDA #OWRIT
0400       STA ICAX1,X
0410       LDA #0
0420       STA ICAX2,X
0430       JSR CIOV
0440 ;
0450       LDA #PUTCHR
0460       STA ICCOM,X
0470 ;
0480       LDA #TXTBUF&255
0490       STA ICBAL,X
0500       LDA #TXTBUF/256
0510       STA ICBAH,X
0520       RTS
0530 ;
0540 PRNT
0550       LDX #IOCB2
0560       LDA #BUFLEN&255
0570       STA ICBLL,X
0580       LDA #BUFLEN/256
0590       STA ICBLH,X
0600       JSR CIOV
0610       RTS
0620 ;
0630 CLOSED
0640       LDX #IOCB2
0650       LDA #CLOSE
0660       STA ICCOM,X
0670       JSR CIOV
0680       RTS
0690 ;
0700 TXTBUF = *
0710 ;
0720       *=  *+BUFLEN
0730 ;
0740       .END
```

LISTING 2

```
10 ;
20 ;PRTSMPLE
30 ;
40 TXTBUF =   $504C
50 OPNSCR =   $5003
60 PRNT   =   $5031
70 ;
80 EOL    =   $9B
90 ;
0100      *=  $0650
0110 ;
0120 TEXT .BYTE "HELLO FROM ANTIC MAGAZINE",EOL
0130 ;
0140 RSPONS
0150 ;
0160      LDX #0
0170 LOOP
0180      LDA TEXT,X
0190      STA TXTBUF,X
0200      CMP #$9B
0210      BEQ FINI
0220      INX
0230      JMP LOOP
0240 FINI
0250      JSR OPNSCR
0260      JSR PRNT
0270 INFIN
0280      JMP INFIN
```

print large signs to welcome the holidays

BANNERTIZER

Article on page 90.

LISTING 1

```
5 REM BANNERTIZER
6 REM BY JOHN BAUMAN
7 REM ANTIC MAGAZINE
10 DIM BINCOD(8),P$(80),S$(1),X$(1),PI
XMAP(64),BANR(255),BANNR$(255),ROWMAP(
8)
20 REM TITLE SCREEN
30 GOSUB 4000
40 TRAP 40
50 REM GET BANNER
60 GRAPHICS 0:SETCOLOR 2,0,0
65 PRINT "INPUT 0 FOR A HORIZONTAL BAN
NER":PRINT "INPUT 1 FOR A VERTICAL BAN
NER":INPUT HV
70 IF HV<>0 AND HV<>1 THEN GOTO 10
80 TRAP 80
90 GRAPHICS 0:SETCOLOR 2,0,0:PRINT "EN
TER CHARACTER SIZE - FROM 1 (SMALL) TO
 10 (BIG).":INPUT CS
100 IF CS<1 OR CS>10 THEN GOTO 12
110 TRAP 110
120 GRAPHICS 0:SETCOLOR 2,0,0:PRINT "I
NPUT LINE TO BANNERTIZE.":? "THEN PRES
S RETURN."
130 ? :INPUT BANNR$:L=LEN(BANNR$)
140 POSITION 13,10:? "NOW PRINTING:":P
OSITION 1,12:? "  ";
145 FOR C=1 TO L
150 CRVAL=ASC(BANNR$(C,C))
160 REM ADJUST CHARACTER VALUE
170 GOSUB 1000
180 REM CALCULATE OFFSET OF CHAR FROM
START OF CHARACTER SET AND THEN CALCUL
ATE ACTUAL START OF CHAR IN SET
190 OFSET=CRVAL*8
200 START=57344+OFSET
210 REM STORE THE BINARY VALUES FOR TH
E CHARACTER IN ARRAY BINCOD
220 FOR P=1 TO 8
230 BINCOD(P)=PEEK(START+P-1)
240 NEXT P
250 REM CREATE A PIXEL MAP OF THE CHAR
ACTER
260 GOSUB 3000
280 REM PRINT OUT THE CHARACTER
290 ? BANNR$(C,C);
300 GOSUB 2000
310 NEXT C
320 GOTO 40
1000 REM CHARACTER VALUE ADJUCTMENT RO
UTINE
1005 INV=0:IF CRVAL>127 THEN CRVAL=CRV
AL-128:INV=1
1010 IF (CRVAL>=32 AND CRVAL<96) THEN
CRVAL=CRVAL-32:GOTO 1040
1030 IF (CRVAL>=0 AND CRVAL<32) THEN C
RVAL=CRVAL+64
1040 RETURN
1045 RETURN
2000 REM PRINTING ROUTINE
2010 PIXPOS=(FST*8-7):S=1
2020 FOR VPOS=FST TO LST
2030 FOR HPOS=1 TO 8
2039 REM IF THE BIT IS A 1 THEN STORE
10 ASTERISKS IN ARRAY S$, OTHERWISE ST
ORE 10 BLANKS IN ARRAY S$
2040 IF (PIXMAP(PIXPOS)+INV=1) THEN S$
="*":GOTO 2060
2050 S$=" "
2059 REM LOOP TO STORE ASTERISKS OR BL
ANKS IN S$
2060 FOR ST=S TO S+9:P$(ST)=S$:NEXT ST
2070 PIXPOS=PIXPOS+1:S=S+10
2080 NEXT HPOS
2090 FOR PRT=1 TO CS:LPRINT P$:NEXT PR
T
2100 S=1
2110 NEXT VPOS
2120 RETURN
3000 REM ROUTINE TO CREATE A PIXEL MAP
 OF THE CHARACTER
3009 REM INITIALIZE POSITION POINTER F
OR PIXMAP ARRAY AND SET PIXL TO VALUE
OF FIRST BIT TO TEST
3010 PIXPOS=1:PIXL=128
3019 REM LOOP TO GET VALUES OF PIXELS
HORIZONTALLY
3020 FOR HPIX=1 TO 8
3029 REM LOOP TO GET VALUES OF PIXELS
VERTICALLY
3030 FOR VPIX=8 TO 1 STEP -1
3035 IF HV=1 THEN PIXPOS=((VPIX-1)*8+H
PIX)
3039 REM TEST PIXEL: IF THE BIT IS A O
NE, THEN STORE A ONE IN PIXMAP; OTHERW
ISE, STORE A ZERO IN PIXMAP
3040 IF BINCOD(VPIX)-PIXL>=0 THEN BINC
OD(VPIX)=BINCOD(VPIX)-PIXL:PIXMAP(PIXP
OS)=1:GOTO 3060
3050 PIXMAP(PIXPOS)=0
3059 REM INCREMENT PIXPOS
3060 PIXPOS=PIXPOS+1
3070 NEXT VPIX
3079 REM SET PIXL VALUE TO NEXT BIT
3080 PIXL=PIXL/2
3090 NEXT HPIX
3095 REM DETERMINE IF EACH 8 BIT ROW I
N PIXMAP IS BLANK OR NOT
3100 FOR X=0 TO 7
3105 ROWSUM=0
3110 FOR Y=1 TO 8:ROWSUM=ROWSUM+PIXMAP
(Y+(X*8)):NEXT Y
3120 IF ROWSUM>0 THEN ROWMAP(X+1)=1:GO
TO 3140
3130 ROWMAP(X+1)=0
3140 NEXT X
3145 REM DETERMINE WHERE THE CHARACTER
'S FIRST AND LAST ROWS TO BE PRINTED A
RE LOCATED
3150 IF CRVAL=0 THEN FST=1:LST=8:GOTO
3190
3155 FOR X=1 TO 8:IF ROWMAP(X)<>1 THEN
 NEXT X
```

continued on next page

```
3160 FST=X-(X<>1)
3170 FOR Y=8 TO 1 STEP -1:IF ROWMAP(Y)
<>1 THEN NEXT Y
3180 LST=Y
3190 RETURN
4000 GRAPHICS 2:SETCOLOR 2,0,0:DL=PEEK
(560)+PEEK(561)*256:POKE DL+11,6
4010 POSITION 2,4:? #6;"THE BANNERTIZE
R":POSITION 2,6:? #6;"by   john bauman"
:POSITION 4,9:? #6;"push  start"
4020 IF PEEK(53279)=6 THEN POKE (53279
),8:RETURN
4030 GOTO 4020
```

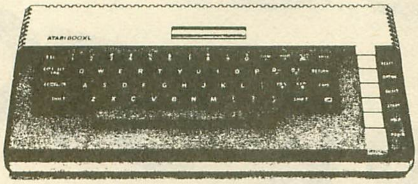
TYPO TABLE

Variable checksum = 1154052

Line num range	Code	Length
5 - 80	XB	374
90 - 180	IX	502
190 - 310	PQ	268
320 - 2039	HH	403
2040 - 3009	PC	364
3010 - 3070	BH	440
3079 - 3150	HJ	416
3155 - 4030	DI	422

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3. HOME INVENTORY
4. RENUMBER 5. COMPARE: listings for differences
6. MODEM 7. RT CLOCK and more

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2. TINY TEXT: from ANTIC Vol.1, No. 6
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GAMES #8 NEW		☐
GAMES #9 NEW		☐
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MUSIC #1		☐
MUSIC #2		☐

	CASSETTE	DISK
UTILITY #1		☐
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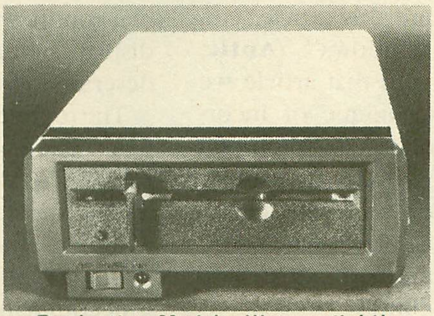
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WINDOWS PART II

by JERRY WHITE and DAVE CULBERTSON

The conclusion of a two-part series that shows you how to create on-screen text windows in Atari programs—in all *graphics modes. The BASIC program, Listing 1, runs on all Atari computers of any memory configuration. Antic Disk subscribers RUN "D:WINDOWS2.BAS".*

To best understand this article, you should read "Windows" (**Antic**, November 1984). In that article we explained the technique of incorporating text windows in Graphics 0 text displays. We used two assembler subroutines to convert ASCII characters to screen display format and display the characters in a text window that you define.

This time we add another machine-language routine to provide high-speed display of colorful text within a graphics window in *any* BASIC graphics mode. For a demonstration, type in Listing 1, check it with TYPO, SAVE a copy, then RUN it. The program displays Graphics modes 8 to 3 in succession with a short pause in between, and creates three windows in each Graphics mode. The text in each window shows the current Graphics mode and the color used for that window. You needn't enter the assembler source code in Listing 2; this is provided for those who wish to alter the subroutine.

To understand how the program works, examine the listing. We add 16 to the graphics mode numbers in lines 180–230 to tell the computer to use the entire screen for the graphics mode. If you alter this demo to use the routines in your own program, make sure that your MSG$ ends with CHR$(0) (looks like a heart, obtained by pressing [CTRL][,]), and WORK$ is cleared as shown in line 280. WORK$ must be 16 times the length of MSG$.

The BASIC demo stores two assembler routines in strings. The window display subroutine stored in W$ is described in last month's article.

The routine stored in E$ must reformat our message (MSG$) before the routine in W$ can move it into a graphics window. Line 330 in Listing 1 demonstrates how to use the reformatting routine in E$ with a BASIC USR command. The first parameter is the address of the routine, followed by the address of WORK$, the address of MSG$, the length of MSG$ less one, and a color code. In the demo, the variable "LINE" is used as the color code. When the three messages are displayed on the screen, the color code used for each message appears next to the world 'type.'

Again, **Antic** is interested in printing any unusual or interesting use for these routines that you come up with.

***Antic** Contributing Editor Jerry White is a leading professional programmer of Atari software. Dave Culbertson is vice president of Custom Electronics, Inc., an applications software house.*

listing continued on page 57

LINDA TAPSCOTT

ALL ABOUT I/O

Important tutorial for both assembly language and BASIC

by MARK ANDREWS

A complete tutorial explaining how to print to the screen in assembly language. Includes valuable information on the I/O system for all programmers, but assumes some beginning knowledge of machine language. Two demonstration listings are included which will run on all Atari computers but require either Atari Assembler Editor or Mac/65 (OSS). Antic disk subscribers should follow the procedure outlined in the article. Both object and source files are on the disks.

If you're an advanced beginner or intermediate Atari programmer, you're aware that the techniques for controlling Input and Output (I/O) activities are not always easy to figure out. In fact, this topic brings in questions from **Antic** readers month after month. But now, every answer you need for taking full charge of your I/O destiny is right here . . . in **Antic**'s second excerpt from Mark Andrews' outstanding book *Atari Roots — A Guide to Atari Assembly Language.*

If you read last issue's excerpt, "First Lesson in Assembly Language", you know why we say that *Atari Roots* is the clearest-written and most understandable book for learning Atari assembly language that we've come across yet. But this chapter, "All About I/O", is just as useful for a BASIC programmer as for an assembly language student—because much of the material is closely related in both languages.

Atari Roots ($14.95) is published by Datamost, 20660 Nordhoff St., Chatsworth, CA 91311. (818) 709-1202.

Types of I/O Devices

Many kinds of I/O devices can be connected to your Atari computer. But there are seven specific kinds of devices that can be addressed in both Atari BASIC and Atari assembly language using specific procedures and specific commands. Each of these seven types of devices has a unique one letter abbreviation, or device name, by which it can be addressed in both Atari BASIC and Atari assembly languages. These seven types of devices, and their corresponding device names in both BASIC and assembly language are:

- Keyboard (K:).
- Line Printer (P:).
- Program (Cassette) Recorder (C:).
- Disk Drives (D:) (or, if more than one disk drive is used, D1:, D2:, D3:, and D4:).
- Screen Editor (E:).
- TV Monitor (Screen) (S:).
- RS-232 Serial Interface (R:).

Note the colon following the letter in each of these abbreviations. The colon is an integral part of each device name, and may not be omitted.

The Eight Atari I/O Operations

In both Atari BASIC and Atari assembly language, there are eight I/O operations that can be performed using the seven abbreviations, or device names, listed above. These eight I/O operations are:

- OPEN (to open a specified device).
- CLOSE (to close a specified device).
- GET CHARACTER (to read one character from a specified device or file).
- PUT CHARACTER (to write one character to a specified device or file).
- READ RECORD (to read the next record, a string which must end with a return character [$9B] from a specified device or file).
- WRITE RECORD (to write a record, a string, which must end with a return character [$9B] to a specified device or file).
- STATUS (to get the status of a specified device).
- SPECIAL (to perform a specified special operation on specified device used primarily in file management and RS-232 serial operations).

How Device Names and I/O Operations are Used Together

In both Atari BASIC and Atari assembly language, all of the I/O operations listed earlier are designed to be performed using a centralized peripheral interface system called the *Central I/O Utility*, or *CIO*. The Atari CIO system, like most peripheral interface systems, is designed to handle sequences of data bytes called *files*. A file may contain data, text, or both, and it may or may not be arranged by *records*, strings of text or data separated by end of line characters (ATASCII code $9B). Some files, such as files recorded on disks, can be given individual *names* (such as "D1:TESTIT.SRC). Other files, such as those used with the Atari screen editor or line printer, do not have individual names, but are addressed simply by the name of the device on which they appear, for example, "E:" or "P:".

Both Atari BASIC and Atari assembly language allow programmers to access up to eight different devices and/or files at the same time. In both BASIC and assembly language, this access is provided via eight dedicated blocks of memory that are called *Input/Output Control Blocks*, or *IOCBs*. In Atari Assembly language, just as in Atari BASIC, the eight IOCBs are numbered from 0 to 7. In both assembly language and BASIC, any free IOCB number can be assigned to any I/O device, although IOCB #0 is always assigned to the screen editor when an Atari computer is first turned on, and is the screen editor's default IOCB number.

Opening a Device

In both Atari BASIC and Atari assembly language, I/O devices are assigned IOCB numbers when they are first addressed, or *opened*. When a device is first opened for either read or write operations, an IOCB number must be assigned to it. Once an IOCB number has been assigned to a device, the device can be referred to by that number until a command to close the device is issued. Once a device is closed, the IOCB number that was assigned to it becomes free again, and can be used to open any other device in your computer system.

Assembly Language Lacks IOCB Commands

In Atari BASIC, specific commands are provided to open, close, read from and write to any I/O devices that may be connected to a computer. No such commands exist in 6502 assembly language. The IOCB system used in Atari computers does provide the assembly language programmer with a means of handling all of the I/O devices that can be connected to an Atari computer. It can handle it in a way that is relatively easy to manage and easy to understand.

Opening a Device Using Atari BASIC

It is not difficult to open a device or a file using Atari BASIC. To open a device or a file, all a BASIC programmer has to do is write a line using the following formula.

```
10 OPEN #n,n1,n2,filespec
```

The following is an example of an Atari BASIC statement written using the standard IOCB formula.

```
10 OPEN #2,8,0,"D1:TESTIT.BAS"
```

As you can see, there are five components in an OPEN statement in Atari BASIC: The OPEN command itself, a series of three parameters separated by commas, and a device name plus a file name, if applicable. A mandatory "#" mark appears before the first parameter after the OPEN statement and the device name is followed by a mandatory colon. In addition, the device name and the file name, if applicable, are enclosed in mandatory quotation marks. The meanings of the five components of an OPEN statement are explained below.

1. "OPEN" — the OPEN command.
2. "#n" (#2 in the sample statement above)—The IOCB number. This number, as we have pointed out, ranges from 0 through 7. "#2" in this position means "IOCB #2."
3. "n1" (8 in our example)—A code number for a specific type of input or output operation. In our sample OPEN statement, the "8" in this position is the code number for an output (open for write) operation.
4. "n2" (0 in our sample statement)—A device dependent auxiliary code sometimes used for various purposes (in this case, though, not used).
5. "filespec"—A device name plus a file name, if applicable. In our example, "D1:TESTIT.BAS" refers to a file called TESTIT.BAS which our computer will expect to find stored on a disk in disk drive 1.

How BASIC Processes an "OPEN" Command

When your computer encounters an OPEN command while processing a BASIC program, it carries out a series of standardized operations using the values in each of the four parameters of the OPEN statement. When all of those operations are completed, BASIC jumps to a special OS subroutine called the *CIO vector*, or *CIOV*. The CIOV subroutine then automatically opens the device in question, referring to the parameters that were contained in the OPEN statement (and are now stored in certain memory

continued on next page

locations) in order to make sure that the proper device is opened for the kind of access called for in the OPEN statement.

Advantages of Assembly Language I/O Operations

To understand how a device is opened using Atari assembly language, it's helpful to know how devices are opened using Atari BASIC. That's because BASIC programs and assembly language programs open devices in exactly the same way. The only difference is that when you open a device using BASIC, your BASIC interpreter does most of the work for you. When you use assembly language, you have to do all of the work yourself. Fortunately, there's a payoff for doing all of this extra work. When you control your system's CIO system using assembly language, you have a lot more control over the system than you do when you allow BASIC to do all the work.

Opening a Device Using Assembly Language

Now let's take a look at exactly how devices are opened, read from, written to and closed, in both Atari BASIC and Atari assembly language.

Another Look at IOCBs

As we've pointed out, the I/O operations of an Atari computer are controlled using a series of eight I/O control blocks, or IOCBs. Each of these I/O control blocks is an actual block of memory in your computer. Each IOCB is 16 bytes long, and each byte in each IOCB has a specific name and a specific function. *Moreover, each byte in each IOCB has the same name, and performs the same kind of function, as the corresponding byte in every other IOCB.* That's important, so let's say it again in a different way: Each byte in each IOCB in your computer has the same name, and performs the same kind of function, as the byte *with the same offset* in each other IOCB.

Indirect Addressing in IOCB Operations

The reason this fact is important is that indirect addressing is used quite often in IOCB operations. Indirect addressing is a technique in which a memory location is sought out by means of an offset value stored in the 6502 processor's X or Y register. Since the offsets of all of the bytes in all Atari IOCBs correspond to each other, that makes the indirect addressing mode very easy to use in Atari IOCB operations.

The 16 Bytes of an IOCB

This concept is much easier to understand when examples are given. So an actual assembly language program will be used to explain the Atari I/O system. It shows how to print messages on the screen.

Listing 1 is the program which we will examine. Listing 2 is a brief routine which uses listing 1 to print a short message to the screen. To use the two listings, type them in using either Atari Assembler Editor or Mac/65. Save the source code to disk: listing 1 will be PRNTSC.ASM and listing 2 PRTSMPLE.ASM. Next, assemble the two source files into compiled object files called PRNTSC.OBJ and PRTSMPLE.OBJ. (See your assembler for proper procedure.) Atari DOS 2.0 users should load both files into memory by typing L and then the filename for each file. After the files are in memory, type M and respond to the address prompt with 066A. DOSXL users should LOAD each file then type RUN 066A.

"PRNTSC.ASM," Line by Line

Now we'll take a good close look at this program and see how it works, line by line. We'll start with the first three lines of the program, lines 290 through 310.

Initializing a Device for "OPEN"

```
300 LDX #IOCB2
310 LDA #OPEN
320 STA ICCOM,X
```

Substitute literal numbers for the variables in these three lines, and this is how they will read.

```
300 LDX #$20
310 LDA #$03
320 STA $342,X
```

These instructions are all it takes to open a device in Atari assembly language. To understand what they do, you have to know something about the structure of an Atari IOCB. As we've pointed out, there are eight IOCBs in your Atari's operating system, and each one contains 16 bytes (or $10 bytes in hexadecimal notation). That means that to address IOCB #1, you have to add 16 (or $10) bytes to the address of IOCB #0 and to address IOCB #2, you have to add 32 (or $20) bytes to the address of IOCB #0. In other words, when you use the address of IOCB #0 as a reference point (as the Atari CIO system does), the *offset* you have to use is 32 in decimal notation, or $20 using the hexadecimal system. Here are all of the IOCB offsets used in the Atari CIO system:

The Eight Atari IOCB Offsets

IOCB0 = $00	IOCB4 = $40
IOCB1 = $10	IOCB5 = $50
IOCB2 = $20	IOCB6 = $60
IOCB3 = $30	IOCB7 = $70

Now let's take another look at our literal value version of the first three lines of the PRNTSC.SRC program:

```
300 LDX #$20
310 LDA #$03
320 STA $342,X
```

Now you can begin to see why the number $20 has been loaded into the X register in line 300. Obviously, it's going to be used as an offset in line 320, but before we move on to line 320, let's take a look at line 310, the line in between. In line 310, the accumulator is loaded with the number $03—which has been identified back in line 110 of the program as the "token for opening a device." Now what does that mean?

I/O Tokens

Well, in the Atari CIO system, each of the eight I/O operations described at the beginning of this chapter can be identified by a one-digit (hex) code, or *token*. Here is a complete list of those tokens, and the operations for which they stand.

Token	Name	Function
$03	OPEN	Open a specified device or file.
$04	OREAD	Open a device or file for read operations.
$08	OWRITE	Open a device or file for write operations.
$05	GETREC	Read a record from a specified device or file.
$07	GETCHR	Read character from specified device or file.
$09	PUTREC	Write a record to a specified device or file.
$0B	PUTCHR	Writ character from specified device or file.
$0C	CLOSE	Close a specified device or file.

Line 310 Explained

Now you can see what happens in line 310 of the program PRNTSC.ASM. The accumulator is loaded with the number $03, the token for "OPEN". In line 320, the OPEN token is stored in the indirect acddress ICCOM,X (or $342,X). Just what is this address?

ICCOM is the name of one of the 16 bytes in an IOCB. Specifically, ICCOM is the first byte (the zero offset byte) in every IOCB. Look at line 170 of the PRNTSC.ASM program and you'll see that ICCOM is located at memory address $342, and is identified as the "command byte" in the Atari CIO system. It is called the command byte because it is the byte that must be addressed when devices are to be initialized, opened or closed. ICCOM is the byte that points to a set of subroutines in your computer's operating system that perform all of those functions.

IOCB Addresses

Since we have listed all of the Atari I/O devices, I/O commands, I/O offsets and I/O operation codes so far, we might as well provide a list of ICCOM and the rest of the 16 bytes in each of your computer's IOCBs. Here is a complete list of the bytes in each IOCB.

Byte	Adrs	Name	Function
ICHID	$0340	Handler I.D.	Preset by OS
ICDNO	$0341	Device Number	Preset by OS
ICCOM	$0342	Command Byte	Controls CIO operations
ICSTA	$0343	Status Byte	Returns status of operations
ICBAL	$0344	Buffer Address, Low	Holds address of text buffer
ICBAH	$0345	Buffer Address, High	Holds address of text buffer
ICPTL	$0346	Unused Pointer	Not used in programming
ICPTH	$0347	Unused Pointer	Not used in programming
ICBLL	$0348	Buffer Length, Low	Holds length of text buffer
ICBLH	$0349	Buffer Length, High	Holds length of text buffer
ICAX1	$034A	Auxiliary Byte No. 1	Picks write or read operation
ICAX2	$034B	Auxiliary Byte No. 2	Used for various purposes
ICAX3	$034C	Auxiliary Byte No. 3	Used by OS only
ICAX4	$034D	Auxiliary Byte No. 4	Used by OS only
ICAX5	$034E	Auxiliary Byte No. 5	Used by OS only
ICAX6	$034F	Auxiliary Byte No. 6	Used by OS only

Now you can understand the operation performed in lines 300 through 320 of the PRNTSC.SRC program.

```
300 LDX #IOCB2
310 LDA #OPEN
320 STA ICCOM,X
```

In line 300, the X register is loaded with the offset for IOCB #2: the number $20. In line 310, the accumulator is loaded with the token for the OPEN operation: the number $03. In line 320, the token of the OPEN opera-

continued on next page

tion (the number $03) is stored in ICCOM,X: the command byte of IOCB #2. After a few more operations, we're going to issue a "JSR CIOV" (Jump to SubRoutine) statement, so our Atari will jump to the CIO vector and open IOCB #2, as we have instructed. But first, we're going to have to set a few more parameters, so our computer will know exactly what kind of operations to open IOCB #2 for. So let's zip right through the rest of this "OPEN" operation now.

In lines 340 through 370, the text buffer in IOCB #2 is loaded with the address of a variable defined in line 270 as DEVNAM. The variable DEVNAM, as you can see by looking at line 270 contains the ATASCII code for the character string "E:"—the device name for the Atari screen editor. We could have opened IOCB #2 for any other I/O device in exactly the same way. If we wanted to use IOCB #2 as a printer IOCB, for example, we could have written line 270 this way:

```
270 DEVNAM .BYTE"P:",EOL
```

Then in lines 340 through 370, the address of the ATASCII string "P:",EOL would be loaded in ICBAL,X. With that tiny change, the PRNTSC program, instead of opening your computer screen as an output device, would open your printer! You can also use this same programming procedure to open a specific file on a disk so that you can read from it or write to it, on either a character-by-character or a record-by-record basis. In the PRNTSC program, we could open a disk file instead of the screen editor by changing line 270 to read something like this:

```
270 DEVNAM .BYTE"D1:TESTIT.BAS",EOL
```

Then, instead of opening the screen editor, our program would open the disk file TESTIT.BAS (provided, of course, that there was a disk drive connected to our computer and that all other necessary conditions for opening such a file existed). We have just seen two examples of the tremendous power of the Atari CIO system. While the system may seem complex at first glance, its incredible versatility is a real testament to the programming know-how of Atari's computer designers.

Moving Along

Let's continue on now with our "OPEN" operation. In lines 390 and 400, we load the number $08 the token for "open a device for a write operation" into Auxiliary Byte No. 1 of IOCB #2. We could make our program do something completely different if we stored the value $04, the token for "open read," in ICAX1,X instead of the value $08, the token for "open write." That's another demonstration of the versatility of the Atari CIO system.

We have now read lines 410 and 420, in which we clear Auxiliary Byte No. 2 of IOCB #2 (a byte that is not used in this routine) by stuffing it with a zero. Finally, in line 430, we jump to the Atari CIO vector at memory address $E456. With that operation, we have opened IOCB #2 for a write operation to the Atari screen editor. In other words, we have opened IOCB #2 to print on the screen.

Printing a Character

We have not yet actually printed a character on the screen, however. To do that, we must carry out two more sequences of I/O operations. Now that you understand how the Atari CIO system works, that will be a snap. Look at lines 450 through 610 of the PRNTSC.ASM program.

In lines 450 and 460, we store the number $0B, the token for a "put character" operation, into the command byte of IOCB #2. In lines 480 through 520, the address of the text buffer we have created especially for this program is stored in the buffer address bytes of IOCBC#2. That prepares us for the PRNT routine that starts at line 540. In the PRNT routine, which extends from line 540 to line 610, the length of our specially created text buffer is stored in the buffer length bytes of IOCB #2. Then there is another jump to the CIO vector, which automatically takes care of printing the text in the PRNTSC text buffer on your computer screen.

Closing a Device

When you open a device in assembly language (as in Atari BASIC), you must close it when you're finished with it. Otherwise, you'll cause an IOCB error, and that could cause some serious problems.

Forgetting to carry out such tasks as closing IOCBs (at the time they should be closed) can lead to program crashes and long and agonizing debugging sessions. Anyway, IOCB #2 is closed in this version of the PRNTSC program. in Lines 630 through 680, the value of $0C—the token for closing a file—is loaded into ICCOM,X. Then there's a jump to CIOV, and the Atari OS closes the IOCB.

Mark Andrews has written 11 books about computers and is a syndicated computer columnist. He recently moved from Manhattan to San Francisco's Telegraph Hill.

Listing on page 60.

product reviews

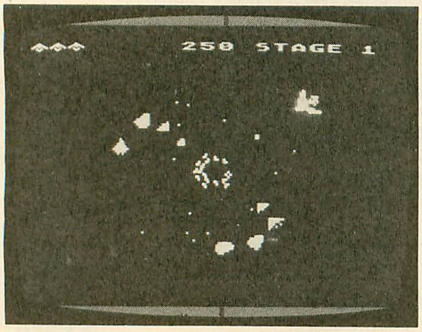
GYRUSS

Parker Brothers
50 Dunham Road
Beverly, MA 01915
(617) 927-7600
$39.95, 16K—cartridge

Reviewed by David Plotkin

Gyruss is one of the very best arcade translations available for Atari home computers. It's fast and exciting, and features a dynamite sound track of sped-up Bach.

You're piloting a space ship which circles the edges of the screen under



joystick control. Clouds of aliens try to prevent you from reaching home, whirling and swirling as they come.

You begin your journey in the far reaches of the solar system, out beyond Neptune. To return to Earth, you must make a series of warp jumps between planets. The problem is that every time you come out of warp you're under attack by the ubiquitous aliens. They emerge from various points around the screen and follow a swirling pattern toward the center of the screen.

In order to survive, you must obliterate all the aliens with your missiles, which converge on the center of the screen regardless of your position. The aliens shoot back, of course, while attempting to ram your ship. In addition, you must contend with space mines, force field satellites, and indestructible meteors. It all adds up to an exciting and addictive gaming experience.

The key to success at Gyruss is memorizing the patterns and positions at which the aliens emerge. Even this is not foolproof, however. Sometimes a wave of aliens will appear from a position which is not part of the normal pattern—a random element calculated to keep things interesting.

The multicolored graphics are attractive, but motion is a little jumpy. Play action is fast and furious, however. The planets, which are rendered quite artistically, provide a visual reward for surviving that far. The stars emerging from the center of the screen and the aliens changing in size give a good 3–D effect. Playability is carefully orchestrated, although there is a significant jump in difficulty between Mars and Earth—it will take you a while before you make it through the last three warps. Achieve your goal, and you start over again at a considerably more difficult level.

SPELUNKER

Broderbund Software
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170
$29.95, 48K—disk

Reviewed by Bryan Welch

Dreams of fabulous riches have always plagued men, and those dreams form the plot for **Spelunker**. Your challenge is to make your way to the very bottom of a cave and find the hidden treasure.

That's simple enough. But, as with most arcade games, there are plenty of obstacles. Standing between you and your fortune are lava pits, bloodthirsty bats, restless ghosts, and countless other hazards. In order to win, you'll need to use all the skill, speed, and wit at your command! Why wit? Because, unlike many games, Spelunker combines arcade action with diabolic puzzles and confusing mazes. For example, in order to gain entry to the next level of the cave, you may first need to find the key that will open a door blocking your way.

There are a lot of surprises awaiting an explorer skilled enough to make it to the deeper levels. Each level is totally unique, and just when you think you've seen everything, a new puzzle pops up to confound you!

Maneuvering is a vital part of the gameplay. You'll need to jump, run, and climb your way through every part of the cave—no easy task. But don't be discouraged—half of the fun is learning how to maneuver your man through the cave.

Have you ever played a game in which you continually lose, but keep playing anyway? Spelunker is a perfect example of this type of game. It is extremely difficult to master, but,

MINI-R

FROGGER II: THREEEDEEP

Charming graphics and music highlight the latest **Frogger** scrolling game. The little amphibian must swim past hungry barracudas and alligators to score points and reach the pond's surface. Points are awarded for completing the underwater, surface and airborne screens, each of which is filled with perils.

Frogger II is a well-designed joystick game. Graphics and ease of play are satisfying. Two or three hours of serious play are enough to exhaust the game's possibilities. Frogger II would probably suit younger players more than adults. —M.C.

See your retailer for prices. Atari Corp., 1265 Borregas Avenue, Sunnyvale, CA 94086. Phone (408) 745-2000. 16K—cartridge.

BEACH-HEAD

Beach-head is one of the better

as you keep playing, you gain proficiency, and make it farther and farther into the mysterious cave. Each time you play, you make a little more progress, and when the game ends, you wonder what new discoveries were ahead of you, so you try again!

Spelunker includes spectacular graphics, and sound effects to match! The cave itself is attractively depicted. When you move off the edge of the screen, your man doesn't just appear in the next part of the cave—the screen scrolls to it! Sound effects are abundant, from the tapping of his footsteps as he trods onward, to the threatening sound of a ghost approaching.

I wholeheartedly recommend Spelunker to anyone who likes arcade-type games and is looking for a challenge. It's one game you'll always come back to.

EVIEWS

recent games. Choose from four levels of difficulty and attempt to destroy the fortress of Kuhn-Lin. To do so, you must navigate a mined passage while dodging torpedoes, or meet the enemy head-on. If you choose the latter, you'll have to shoot at enemy fighters, sink battleships and cruisers, penetrate beachfront defenses and eventually destroy the fortress.

You use your joystick to steer, aim and fire weapons. The screen puts you on the deck of a ship, at the machine gun's triggers, or in similar tactical position. There is a "realistic" response to steering a ship and an excellent correlation between joystick movement and gun aim. The graphics and sound are fine, and the game is intricate and varied enough to provide long-term entertainment.

—M.C.

$34.95, Access Software, 925 East 900 South, Salt Lake City, UT 84105. Phone (801) 964-0566. 48K—disk.

FOOTBALL

Atari Corp.
1265 Borregas Avenue
Sunnyvale, CA 94086
(408) 745-2000
$49.95, 16K—cartridge

Reviewed by Gordon Wong

Atari Football is the home computer version of the popular Atari 5200 Football (see **Antic**, October 1983). The game requires two joysticks for one or two players. In the one-player practice game, you control the offensive team and choose the defensive play, but the computer moves the defensive team.

The game screen is identical to that of the 5200 version. A scoreboard displays all pertinent information, and beneath this is the football field complete with first down marker, combination scrimmage/down flag, and yardage lines. During play action, the field scrolls horizontally to keep the ball centered on the screen (similar to a TV camera panning the field). Each team has six men: you control the quarterback on offense and the middle lineman on defense.

During each play, the offense uses the joystick to pick one of three team formations and one of five plays described graphically on a play chart. The defense selects similarly from one of five defensive plays. In each play, the non-controlled team members move to different patterns. To boggle the opposition even more, you can also change your play once before the hike, throw to one of two eligible receivers on offense, or transfer joystick control to your receiver or guard to better catch a pass or intercept it.

Atari Football is best played with two players since computer opposition is not very sophisticated. With two human players, the game becomes very exciting and challenging. The fifteen offensive plays and five defensive plays are quite varied and not easily memorized. Although looking up these play patterns on the charts takes a little longer, this variety keeps the game interesting.

Atari has done a good job of fitting this rendition of a favorite sport into a 16K cartridge that makes it available to every Atari computer owner. This means, however, keeping the size of the program down. One casualty of this budgeting is that there are no penalties, handoff plays, timeouts, fumbles, or kickoffs (although pause control, punts, and fieldgoals, and blocked attempts are included). Also notably missing are the national anthem, the roar of the crowd, and halftime activities. Just thinking of what a 48K version could have been is depressing.

The animation and sound of Atari Football are accomplished, and amusing to watch (a touchdown, of course, earns a little dance). As in real football, different types of players run at different speeds. About the only thing bothersome during gameplay is that the defensive backs are programmed to stay with the receivers only until the end of the receiver's runs, leaving the receiver wide open to a quarterback who can stay untackled long enough to throw a pass to them.

Overall, I recommend Atari Football highly because of its variety and strategy qualities, good arcade graphics and sounds, and also because the play mechanics of running and passing are much easier to master, as compared to other football programs on

continued on next page

the market. Now if the game had a smarter computer opponent, got rid of the need for two joysticks in the one player game, and had a few more bells and whistles . . . (are you listening, Atari?!)

KEYSTONE KAPERS

Activision, Inc.
2350 Bayshore Frontage Rd.
Mountain View, CA 94043
(415) 960-0410
$34.95, 16K—cartridge

Reviewed by Ellen Keyt

Keystone Kapers, originally written for the Atari game system, has now been released for the computer. You, as one of the famous Keystone Cops, have cornered an escaped convict in the local three story department store. Unfortunately, if you don't catch him soon, the store will open and the lives of innocent people will be endangered. Attempting to avoid capture, the criminal has made your job even more difficult by bombarding you with rubber balls, toy airplanes, and shopping carts that you must either jump over or duck. The robber also dodges you by moving from floor to floor. The only way to follow him is by either using one or the escalators or the temperamental elevator that always seems to move to the next floor just before you reach it.

Because the store is so large, it has been spread over eight screens. By going to the edge of one screen, you instantly appear in the next screen. The escalators have been placed at opposite ends of the store, which makes them harder to use than the elevator, located in the middle screen. To even this out, the elevator moves from floor to floor so slowly that the only worth-while time to use it is on the upper levels, where you try to stay on one screen, rather than risk your life by running all over the store to use the escalators.

The different levels of play make it a perfect game for anyone.

Although the background graphics are plain and shadowy, player/missile graphics in the foreground produce smooth playing and some very convincing animation. Shopping carts and toy airplanes whiz by while rubber balls bounce realistically across the screen. The Keystone Cop's legs

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stretch when he jumps over a shopping cart, his uniform creases when he squats to duck a toy airplane, and he even pumps his hands up and down, waving his stick when he runs.

There are 16 levels of play, each one speeding up until the different obstacles are mere blurs and the rubber balls bounce all the way to the ceiling. Because Keystone Kapers is such a simple game to learn, the different levels of play make it a perfect game for anyone. Children can start on level one, where they can watch the superb animation, while adults may prefer to begin on a higher level where they can enjoy the fast action.

Keystone Kapers is a very good game and will provide hours of fun for children of all ages—if they can get their parents away from it.

PUZZLE PANIC

EPYX, Inc.
1043 Kiel Court
Sunnyvale, CA 94089
(408) 745-0700
$34.95, 32K—disk or cassette

Reviewed by Fred Pinho

Puzzle Panic is one of the new breed of hybrid games combining puzzles with arcade action. It consists of eleven puzzles, with variations for a total of 42 screens. To fully complete the game, you must go through each screen in correct sequence. You then get a chance at the biggest challenge, the "Metasequence". To solve it, you must have deduced the meaning of the numerous symbols used in the game and the correct order of the puzzles. EPYX offers a contest drawing for those who've correctly completed the puzzle. The winner gets a weekend at an Atlantic City casino with Ken Uston.

Once you've completed a puzzle, gates open on the screen. Each gate contains a symbol. You must choose the correct symbol to move forward to the next puzzle. An incorrect choice transports you back to earlier puzzles.

You maneuver an animated light bulb named Benny to solve each puzzle. Built-in hazards range from time limits to frequent use of a monster chaser. The chaser's advantage is that it can move diagonally while Benny cannot. The monster always goes straight for Benny so that planning moves while avoiding the chaser gets hectic. Although the main objective is to solve each puzzle, score is also kept. If Benny gets zapped, you lose a life which reduces your score. Unlike arcade games, you can stay with a puzzle, no matter how many lives you lose, until it's solved.

The puzzles range in difficulty from easy to hard. Determining what's required to solve the puzzle is usually easy. The challenge comes in doing it without getting zapped by the chaser or running out of time. The puzzles get more difficult as you progress through the sequence. Typical puzzles involve placing a moving card in the correct sequence, capturing polygons in the correct order, following a moving block without losing contact, climbing a wall of color and mimicking a series of notes. The graphics are simple yet cute and colorful. A nice touch is the ability to call up any puzzle for practice via the [OPTION] and [SELECT] keys. Simple tunes play in the background for each puzzle. If that annoys you, there is an option to turn them off.

Puzzle Panic is a nice blend of puzzle solving, strategy and arcade action. The puzzles are nowhere as frustrating as the typical adventure game. Neither are the arcade segments as demanding as the typical shoot-em-up. For those not gifted with the joystick touch (the majority of us), this game will give a sense of accomplishment since every screen is conquerable.

The game has been crafted with obvious attention to detail and is fun to play. Ken Uston, the blackjack whiz turned software designer, made good use of his time away from the casinos.

SUPER MAILER PLUS

Royal Software
2160 W. 11th Avenue
Eugene, OR 97402
(503) 683-5361
$49.95, 48K—disk

Reviewed by Joy Shulman

Super Mailer Plus is a convenient and easy-to-use program that's really "much more than a mailing list." Menu-driven and well-documented for the beginner, it is also very usable as a simple database for small businesses and for many home needs. A step-by-step tutorial walks you through the various functions clearly, and screen prompts take care of the rest, especially for users with one disk drive.

As a mailing list, it can sort, print and search for information by any field—including name, Zip code, or any of your own customized information codes. The program can also do a "Zip Sort" on multiple fields within each Zip code—first by Zip code, second by last name, and third by first name. Trying to reach people whose Zip codes you don't know? No problem: Just tell Super Mailer Plus to search by city, phone area code, or any geographical area you designate as a code. I found this feature very useful to target people for specific events in their area. No need to waste postage on people living too far away to attend.

The Retrieve-by-Code feature can also be used to keep track of birthdays, anniversaries, sales contract numbers, personal interests, financial or marital status, whether or not they sent you a Christmas card last year—

continued on next page

product reviews

or any information you customize to your specific needs. Then you can create a subfile to easily locate people according to data they have in common.

Another helpful feature is an instant-reference listing two-letter state postal abbreviations within the United States. Included is a really time-saving feature called "Auto Data Repeat." This lets the computer enter for you any data that repeats from the same field of the previous record entered. Why type the same city name, for example, hundreds of times?

For addresses outside the U.S., however, I found the city-state-Zip code format limiting. This can probably be gotten around by a feature that allows the user to rename any of the 8 fields and bring the "Data" field as a line of the address. This involves a few extra steps which could be simplified by future editions simply including an extra line to accommodate other countries. The ability to print the "Data" field as a line of the address is also useful for contacting individuals at a business address.

It can sort, print and search for information by any field.

Printing can be done as a database file copy, or on labels. The label format is preset for standard 1″ × 3-1/2″ labels, but is very easily changed to any size label and spacing, from 1 to 9 lines. The program can print labels laid out 1, 2, or 3 across on a sheet or roll of paper, depending on your printer.

Super Mailer Plus is also a small database adaptable for many household uses. It can help catalog your books, records or tapes (and who you lent them to), correspondence, collections, and even recipes. The authors suggest using the special code field to sort for special ingredients, food type, season, etc. This could be a real help when trying to cook a large meal for a group of people with different favorite foods, allergies and/or dietary needs.

Easy to understand and customize for individual needs, this program can help you organize things you might have never thought organizable. Its uses are as unlimited as the user's imagination.

MUSIC CONSTRUCTION SET

Electronic Arts
2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171
$40, 48K—disk

Reviewed by Jerry White

If you want to create music on your Atari computer, **Music Construction Set** (MCS) is probably the best tool available today.

Any good music creating software provides the usual enter, edit, load, save, and play functions, but MCS offers much more. If you have a graphic printer, MCS can graphically print sheet music.

With most music editors, you must enter each note using the keyboard. MCS lets you use the keyboard or a joystick. You may also use either the Koala Pad or Atari Touch Tablet to indicate your choice of graphic icons displayed on the screen.

You may use up to four voices in a four octave range, or choose the three voice, five octave range option. You control the speed, volume, and sound. MCS lets you choose from 13 different sound types.

To help get you started, MCS comes with well written documentation and sample song files. The documentation

not only teaches you how to use the software, it also provides information on music notation. Notes, rests, dots, ties, time signatures, sharps, flats, scales, and keys are all explained.

The only real limitation I found is the 700 note maximum capacity. Since the vast majority of songs require less than 700 notes, this should not be considered very important. But it would have been nice if the documentation explained the disk data file structure. This would be useful to those interested in playing MCS in their own programs. In fact, that might be an interesting topic for an article in **Antic**.

THE MASK OF THE SUN

Broderbund Software
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170
$39.95, 48K—disk

Reviewed by Kevin G. Swiger

In Broderbund's new graphic adventure, you're Mac Steele, an Indiana Jones-type archeologist, searching for the fabled **Mask of the Sun**. Opposing you is Francisco Roboff, a not-so-esteemed colleague. Your companion and assistant is Raoul, a fellow archaeologist and linguist. A major complication takes the form of a horrible rotting disease that Mac has contracted. This can only be held off by his bottle of little white pills, with which he must never part.

The graphics in Mask of the Sun are absolutely superb. It's obvious that someone worked hard to produce screens of such quality. And these aren't just pictures tacked onto a text adventure—they're a vital part of the game. I gained nearly as much important information from the screens as I did from the text.

Another aspect I enjoyed was the

continued on next page

ability to enter strings of commands at once, similar to Infocom's Interlogic system. For instance, the computer has no problem with "ENTER JEEP, THEN SEARCH, THEN GET ALL."

While I found the game's quality generally excellent, I have one complaint. I won't describe the particular circumstances to avoid giving anything away, but I was amazed to find a room where nothing but luck and split-second timing would succeed. One reason I was so surprised was that, until this point, the entire game had been geared toward making you use your head. It took a friend and me nearly three hours to get past this room.

A minor flaw is that travel through passages is a little slow. Other than this, I found every facet of the game at least satisfactory, and most aspects to be excellent. In fact, I can hardly wait for Mac's next adventure. So, get to your nearest Atari dealer and buy Mask of the Sun immediately, if not sooner.

ONE ON ONE

Electronic Arts
2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171
$40, 48K—disk

Reviewed by George Adamson

Electronic Arts caged the year's hottest sports simulation in **Julius Irving and Larry Bird Go One on One**. A role-playing match-up involving two of the biggest names in pro basketball, this game is far more than a joystick-driven cartoon fantasy.

You assume the habits of the players —Dr. J is faster and jumps longer, while the stronger Bird is a better rebounder and outside shooter. Programmer Eric Hammond spent hundreds of hours reviewing game films, action shots and interviewing the two stars.

During play, the players automatically rotate their bodies to follow the ball, no matter where they are on the court. The game's only graphics shortcoming is limited color, mostly red, white and blue against a black background. As the game proceeds, you hear the ball bouncing, the referee's whistle, the clock buzzer, the swish of a basket and the crowd's cheers.

Game surprises include a shattering backboard.

With the menu, select the two player game or let the computer play as Dr. J or Bird on any of four levels. There is an official who calls hacking, reaching in or charging, and the screen interrupts play to signal travelling and clearing. You can also choose to play to a predetermined score or in quarters of variable length.

Game surprises include a shattering backboard, following a hard slam. The computer will also interrupt your play to show an "instant replay" of fancy shots.

To win, you must have joystick dexterity and decisive thinking. The computer supplies strengths and weaknesses of the real players, hot and cold streaks and fatigue, which is relieved by calling "time out."

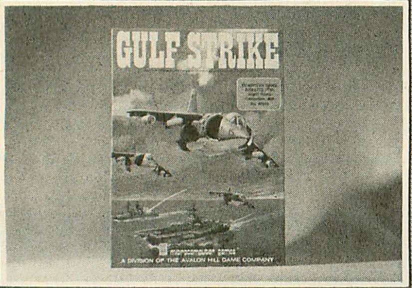
Despite the game's complexity, the disk loads in one pass and there is no annoying drive accessing during play. This game is one Atari program worth its $40 price.

new products

GULF STRIKE

(game)
Avalon Hill
4517 Harford Rd.
Baltimore, MD 21214
(301) 254-5300
48K—disk
$30

Gulf Strike is the simulation of current Islamic war in the Middle East. Russia and Iran are in opposition: the Ayatollah is determined to help his Islamic brethren in Afghanistan. The Soviet Union supports Iraq. The U.S. backs Iran. You command the U.S. Army, Air Force, Navy and Marine Corps. You can play the computer or a living opponent, and you can save games.



ARCHON II: ADEPT

(game)
Electronic Arts
2755 Campus Dr.
San Mateo, CA 94403
(415) 571-7171
48K—disk—joysticks required
$40

Here is a game offering the intricacy of chess. A strategic battle between Order and Chaos is set on a board containing Fire, Water, Air, Earth and Void. As a mage, you can conjure 12 types of monsters. A second screen displays the battleground, where icons from each player's realm battle in fast, arcade-like fighting.

Watch power levels as you conjure monsters and cast spells. Winning occurs when you occupy all six power points, when your opponent runs out of energy, or when you run out of icons. Each monster and spell requires a different level of energy to conjure.

It's not hard to learn the basics, but the variety and strategic subtleties are extensive. This game offers appropriate sound that doesn't overpower the player. The graphics are sufficient to portray different monsters, movement and domains.

T-REX
THE HONEY FACTORY

(educational software)
CBS Software
1 Fawcett Place
Greenwich, CT 06830
(203) 622-2500
48K—disk
$49.95 each

Both parts of CBS' Adventures in Science Series, these games teach scientific thinking and fundamentals of ecology. T-Rex puts you in the role of a Tyrannosaurus Rex 70 million years ago. You must survive. This means controlling the dinosaur's movement, and maintaining levels of food, water and energy. The game is based on recent research, and includes four levels of play.

The Honey Factory puts you in charge of finding locations of pollen and nectar. As a scout bee, you must move through the countryside, locate the food, and find your way back to the hive. At the hive, you assign tasks to worker bees and work to maintain social stability.

ZONE RANGER
ZENJI

(games)
Activision, Inc.
2350 Bayshore Frontage Rd.
Mountain View, CA 94043
(415) 960-0410
$34.95 each, cartridge

The Zone Ranger is a rebel warrior commissioned by Earth in 2130 to explore uncharted regions of space. As the ranger, your goal is survival. There are 30 levels of difficulty filled with deadly drones, planetoids, and the mysterious Super Portal which causes you to enter absolute space vacuum.

Zenji is an attempt to combine glowing graphics, the challenge of a maze, and the depth and philosophy of Zen Buddhism. Your joystick must connect various parts of a maze while avoiding the Flames of Desire and their Illusions.

PQ—THE PARTY QUIZ GAME

(game)
Suncom
260 Holbrook Dr.
Wheeling, IL 60090
(312) 459-8000
32K—disk
$74.95

Up to four players or teams can compete in this 2,500-question trivia game. The price includes four hand-held controllers attached to four-foot cables; there is no need for players to crowd around one keyboard. You can choose the length of the game, the number of players (one to four), and the time allowed to answer a question. You can also handicap advanced players.



SHAPES AND SOUNDS FOR THE ATARI

(software)
John Wiley and Sons
605 Third Ave.
New York, NY 10158
(212) 850-6000
$45

This set includes two disks of expandable sound and graphics effects written in Atari BASIC for beginning and first-time programmers. According to Wiley, the effects can be used to create dramatic sound and light shows of music and pulsating graphics, as well as colorful computer games.

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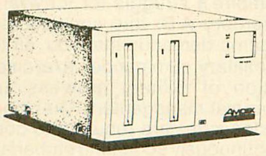
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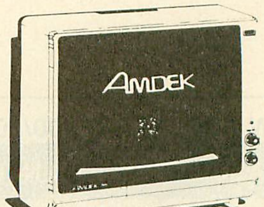


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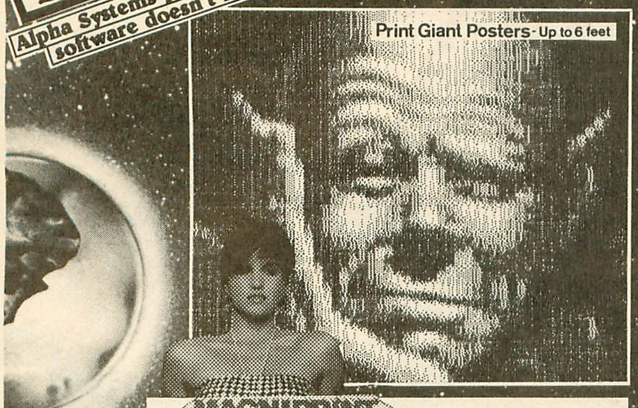
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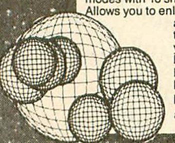
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Type in the program listing, check it with TYPO, and SAVE a copy or two. Before you RUN it, make sure your printer is turned on and on-line. When the title screen appears, press [START]. Next, enter a 0 for a horizontal banner, or 1 for vertical. Then you're prompted to enter a number for letter width from 1 to 10. A one specifies the smallest letter size, and ten indicates the widest. Next, you're prompted to enter your message. The message can be any length up to 255 characters, and may contain any characters, including letters, numbers, and graphics characters. Finally, your banner is printed out. During this, a message on the screen tells you which character is currently being printed. After the banner is printed, the program starts again in case you want to print more banners.

If you'd like to print out your banner with something else besides an asterisk, substitute the character of your choice for the asterisk in line 2040.

John Bauman created Bannertizer while seeking an easy way to print out a large placard of his hometown's name . . . Kalamazoo, Michigan.

Listing on page 61.

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